2013

Building Empathic Consciousness Toward our Biosphere

Lawson R. Wulsin Jr
University of Massachusetts Amherst

BUILDING EMPATHIC CONSCIOUSNESS TOWARD OUR BIOSPHERE

A Thesis Presented

by

LAWSON REED WULSIN JR.

Submitted to the Graduate School of the University of Massachusetts Amherst in partial fulfillment of the requirements for the degrees of

MASTER OF ARCHITECTURE
and
MASTER OF LANDSCAPE ARCHITECTURE

May 2013

Architecture + Design
Landscape Architecture and Regional Planning

BUILDING EMPATHIC CONSCIOUSNESS TOWARDS OUR BIOSPHERE.

A Thesis Presented

By

Lawson Reed Wulsin Jr.

Approved as to style and content by:

_____
Carey Clouse, Chair

_____
Kathleen Lugosch, Member

_____
Mark Lindhult, Member

_____
William T. Oedel, Chair
Department of Art, Architecture and Art History

_____
Elisabeth Hamin, Department Head
Department of Landscape Architecture and Regional Planning

DEDICATION

To everyone and everything
that makes the interdependent web of existence
of which we are a part.

ACKNOWLEDGMENTS

This thesis would not be possible without the generous guidance of faculty who have taught ten inspiring design studios over the last four years: Stephen Schreiber, Ray Mann, Annaliese Bischoff, Joseph Volpe, Frank Sleegers, Peter Kumble, Kathleen Lugosch, Mark Lindhult, Sigrid Miller Pollin, and Joseph Krupczynski.

A special debt of gratitude to Carey Clouse, who has led this thesis and deepened the exploration since the moment she stepped on campus.

The community at the Unitarian Society of Northampton and Florence helped develop my understanding of the interdependent web of existence of which we are a part and supported me in work-shopping some of the ideas through a summer service in July of 2012.

My brothers who played in the woods with me and my parents who took us into the world instilled the commitment to our planet that underlies this entire project.

And to my wife, without whom I would not have had the courage or strength to ask questions without expecting answers, thank you.

ABSTRACT

BUILDING EMPATHIC CONSCIOUSNESS

TOWARD OUR BIOSPHERE

MAY 2013

LAWSON REED WULSIN JR.

B.A., BENNINGTON COLLEGE

M.L.A., UNIVERSITY OF MASSACHUSETTS AMHERST

M.ARCH., UNIVERSITY OF MASSACHUSETTS AMHERST

Directed by: Carey Clouse

Given humankind's ability to dramatically affect the natural systems that support life on our planet, what is the designer's role in building empathic consciousness towards our biosphere?

Our consciousness is the gestalt effect of what we know, feel, and believe. The built environment is both illustrator and shaper of this shared consciousness. Our attitude toward the biosphere is a product of the ways the industrial revolution shaped our landscape, economy, social organization, governance, art, and design. This thesis uses a site in Holyoke, Massachusetts (160 Middle Water St.), to test theories about how spaces change the way we think, feel, and act toward our planet. Holyoke, the first planned industrial city in the nation, is a cultural landscape that tells the story of reshaping natural systems for human benefit.

The program for the space emerges from the budding creative economy in Holyoke. Specifically, movement artists are using dance to build community, increase health and fitness, and express emotional experience. 160 Middle Water offers a vision for this engagement, connecting dancers to the earth, river, and sky.

This thesis builds on the precedents of landscape architects, architects, sculptors, scientists, poets, and ecologists who have shaped our built environment and framed our view of the world. The tools belong to design disciplines, but the theories are shared by those committed to synchronizing ourselves with the interdependent web of existence of which we are a part.

CONTENTS

SECTION IV: DESIGN PROPOSAL

SECTION V: CONCLUSION

LIST OF FIGURES

INTRODUCTION

On an August morning in 2000, my older brother and I woke in the middle of the night after spending a week hiking through the bottom of Arch Canyon in Southern Utah. We walked through the darkness towards the steep edge and climbed. We scrambled using our hands and feet towards the lip of the canyon as night turned to day. As we approached the lip, the sun crested above the horizon and basked the canyon wall. We ascended into dawn and emerged to stand at the edge and face the rising sun; at once in touch with the billions of years our earth has been forming and the moments it takes for the horizon to drop below the sun.

Figure I.1: Arch Canyon, Utah, 2000

Objectives

This thesis uses a site in Holyoke, Massachusetts (160 Middle Water Street), to test theories about how spaces change the way we think, feel, and act toward our planet.

The theories are synthesized from precedent analysis, close readings of prophetic women and men, and conceptual exploration. This thesis is a piece of a much longer journey and includes three major sections excluding including the introduction which lays the personal foundation

for understanding the genesis of the exploration.

In BACKGROUND, a review of literature helps define human consciousness and the role design has played in shaping consciousness throughout the course of human history. Additionally, the Background section addresses the interconnected web of existence of which we are a part; making the case for a more connected and empathic way of living in the world.

TOOLKIT outlines the methodology that led to the conceptual approach to design. This methodology is intended to be replicable by other designers interested in developing and testing strategies for building empathic consciousness toward our biosphere.

The DESIGN PROPOSAL is not intended as a complete answer to the thesis question, but rather, a way of exploring the question at an experiential level. The proposal includes a city-scale plan for a mixed-use movement loop and a detailed analysis of the site at 160 Middle Water Street. The program emerged from theories about ways consciousness is shaped. The design proposal provides a structure for a deep conversation about the moments, spaces, and experiences that build empathic consciousness toward our biosphere.

CHAPTER 1:

SUMMARY

Consciousness

We are part of a densely interconnected web of existence. There are things directly within our control and some things that are completely beyond our control. But most things are simultaneously affected by us and affect us.

Throughout history, designers of every variety – inventor, scientist, politician, and explorer – have shaped the ways in which we interact with this interconnected web.

Holyoke is a product of the first industrial revolution: a city built at the site of Hadley Falls to harness the potential energy of the Connecticut River. Holyoke is a cultural landscape that tells the story of reshaping natural systems for human benefit.

Human Consciousness is shaped by the convergence of communication technologies and energy regimes. Before civilization, oral language and hunting and gathering led to a mythological consciousness in which animals and natural systems were worshiped because survival depended on their good fortune. The advent of handwriting and agriculture brought people together in complex societies and as the literate few controlled the message and held decision making power, a theological consciousness was born in which deities took human form – pharaohs and emperors were thought to have control over weather cycles in part because they had access to royal scholars who kept track of the calendar. Print and electronic communications created the world's first literate workforce which, with access to enormous amounts of energy stored in first coal and then oil, spawned the Industrial Revolution.

Around the world, an Industrial Consciousness that values productivity and promotes the individual places economic and political controls in the hands of the wealthy few.

The shift towards distributed renewables and internet communications in which everyone can

generate energy and content leads us towards lateral power and collective decision making. The Industrial Revolution has left us with atmospheric CO_2 at unprecedented levels – just one of the many natural systems that we have inadvertently, and likely irreversibly, altered.

We have the ability to warm and cool our climate. How we live our lives determines if our great-grandchildren grow up in New England tapping maple trees or harvesting grapefruits. But how will we make this decision? A distributed power system requires a broader way of thinking: a commitment to the complex and interdependent world and an awareness of the gestalt role individuals play in the whole. In short, we need a biospheric consciousness.

Given human kind's ability to dramatically affect the natural systems that support life on our planet, what is the designer's role in building empathic consciousness towards our biosphere?

CHAPTER 2:

ANECDOTES

Honey from Earth

In 1996, I spent a week living with a Maasai tribe in the Loita Hills of Southern Kenya. One morning, we went on a walk across the African savanna the golden hills rolling off in the distance speckled by deep green pockets of forest. This landscape has been colored by nomadic grazing by the Maasai and by the migrations of magnificent herds of wildebeest.

Suddenly, one of the Maasai with us stopped abruptly and raised his hand. He indicated that we would pause here and rest for a while. I found shelter under an acacia tree (Figure 2.1) and was joined by one of the other Maasai who grabbed a few twigs from a nearby shrub and

FIGURE 2.1: Acacia Tree, Kenya

handed me one. He said that while we rest, we might as well brush our teeth and he began scrubbing. I had noticed that in Nairobi, most of the poor Kenyan children had unhealthy teeth – blackened and missing teeth, swollen gums. But within the Maasai tribe we were living with, the children (and the adults) had shockingly white teeth. This significant difference illustrated the positive effects of being in tune with their surroundings. The Maasai knew which trees and shrubs had naturally cleaning properties and I was impressed by how

good my teeth felt after chewing on the twig for a few minutes.

While we rested, I watched a group of Maasai gather around the spot where we were originally stopped. One of them walked over to a tree and wielded his panga (Figure 2.2) – a large

FIGURE 2.2: Maasai Panga

machete-like knife carried by most Maasai – and proceeded to chop a large branch. He returned with an eight-foot pole with a sharpened end, about six inches in diameter. He stood and raised the log over his head and then thrust it straight down into the earth beneath his feet. The red-clay soil began to yield and crumble. There were two others on their knees on either side of the man with the big stick and when he lifted the stick into the air again, the two on the ground reached out and cleared away the loosened earth with their hands. No sooner had they moved the clumps of dirt then the stick came thundering back into the ground, loosening up more chunks. This rhythm, powerful and graceful at the same time, continued for almost an hour. The men rotated jobs since it appeared the one standing and thrusting the stick was working the hardest and tired fastest. The hole deepened and widened. Finally, they stopped and called me over. I was small and light and they asked if they could use my length. They grabbed onto my ankles and lowered me into the hole head first (Figure 2.3). It must have been at least eight feet deep because the man holding my ankles had to extend his arms into the hole and my hands above my head just barely reached the bottom. Resting against the sides of this freshly dug hole, I could feel the cool moistness of the soil. It was dark and damp and incredibly refreshing after spending a week (or a life) above ground. I reached my hands into the bottom of the hole and began exploring a large cavity that emerged from the bottom. It was as if this conical penetration into the earth had punctured a void that had long existed beneath our feet. But this void was not empty; it was full of sweet, nurturing life. I filled my

hands with the warm sticky waxy substance and shouted up. I was pulled from the hole, dirt dragging across my front, with my hands full of honey. Emerging from the hole and standing with my prize, I shared this sweet nectar with the group.

FIGURE 2.3: Honey from Dirt, Kenya, 1996

As we walked through the savanna, the Maasai noticed everything. They knew what shrubs made for good toothbrushes. They knew where to find shelter and how to find food. And they knew to look at the dirt beneath their bare feet. When one of them spotted a hole the size of a pencil, they knew to stop. They knew that it was worth it to spend an hour digging a hole with a stick and hands because at the bottom, was a nest of ground bees that held the sweetest honey I have ever tasted.

Terra Rose

FIGURE 2.4: Red Stone Farm

To make the farm (Figure 2.4) work, Uncle Drausin is counting on the convergence of three fickle forces. This convergence has the potential to reshape the tone shared by Drausin's siblings of skepticism, doubt, and annoyance into a tone more in line with his vision of a family farm operation that is self-supporting and generative: a farm that can be an inspiration to the growing flock of Wulsins.

The three fickle forces are anything but reliable and only the most optimistic of optimists (of which Drausin is exemplary) would presume that salvation lay within the convergence. First, the farm needs to raise capital. Drausin's solution is to sell wetlands mitigation bank credits to developers who want to build over wetlands and need to purchase credits from elsewhere. In 2008, we lowered one dam about four feet, effectively draining a 40-acre wooded lake. 20,000 native wetland trees were planted and all of the invasive species were removed. What stands now is an incredible – and young – ecosystem brimming with potential.

That potential, in addition to the ecological benefits of wetlands, provides significant capital. When U.S. Steel secures funding to build a mill in Portsmouth, they will need to purchase

many, if not all, of the available Wetlands Mitigation Credits from Red Stone Farm.

Second, about 300 acres are devoted to organic dairy production. By renting the land and dairy infrastructure to two Mennonite farmers, the farm can generate additional capital while producing a valuable product using minimal fossil fuels (the Mennonites use horse and human power instead of tractors or trucks powered by oil). In addition to delicious dairy products that can be sold, the dairy operation is important to soil generation. Creating robust soil is necessary to the third strategy.

The final aspect of Red Stone's success requires the most attention from Drausin himself. Raising lambs for the specialty meat market requires intensive attention to the health of the herd, and close cultivation of clients. Raising lambs at Red Stone Farm depends on densely grazing pasture and rotating the herds on a 90-day cycle, so that each pasture has opportunity to re-grow before it is grazed again. The sheep eat all of the organic matter above ground, leaving the roots to re-sprout once they move on. The manure produced by sheep and cows, which is folded into the ground by hooves, builds organic material. The weight per hoof of a sheep, however, is not sufficient to incorporate the manure deep into the topsoil. That's where the cows come in. By rotating sheep and cows in intensive grazing on the same land, Drausin can generate nutrient rich soil that produces the grass necessary to feed sheep that create meat valuable to the ethnic communities whose faith traditions include ritualistic feasting on sustainably raised lambs.

Empathy

FIGURE 2.5: North Channel, Ontario

On a beautiful summer day in July, five of us decided to head off on an excursion. We packed sandwiches and soda, marshmallows and beer. I grabbed my camera equipment and we hopped in the 115 hp motor boat. We headed east, past the lighthouse and into the open water of Lake Huron's North Channel (Figure 2.5)[1]. What was a warm summer day in the protection of St. Mary's River turned into a high wind and high seas experience past the lighthouse. The swells increased and though compared to conditions in the oceans, it was relatively calm, we were way outside of our comfort zone, though nobody was ready to admit it. We spotted a small island (Serpent) on the horizon and headed for it. The spruce and cedar trees complimented a sand-colored pebble beach and both were offset by the crystal clear sky and deep blue waters. We approached the island from the west, but circled around

1 Google

to the east where we would be protected from the wind. The waters around the island were very shallow and we raised our engine and paddled the last couple hundred feet. Since we didn't want to damage the hull of our boat, we tied a ski rope to our bow line and waded the final thirty feet. I tied the rope to a rock and we began exploring our new discovery. We walked along the shore and found fishing nets and other evidence that we were not the first set foot on this place. After about an hour of walking around, we headed back to our boat and discovered it missing. The ski rope was no longer tied to the rock and we could just make out our beloved ship bobbing in the waves headed down wind towards Drummond Island.

I was eighteen years old and realized that we had put ourselves at the mercy of the wind, which was, at the time, appearing relentless. With no way to call for help, we began to build two signal fires, one on the protected west side of the island and one on the east side of the island, facing home, where we expected rescue to come from. The five of us spent the night rotating between the fires, since the windward spot was significantly colder.

At some point in the middle of the night, we noticed lights above the southern horizon moving back and forth. We dared to hope that those lights belonged to a search team. Just before dawn, we began to make out the shapes of two planes oscillating above Drummond and Manitoulin islands, more than five miles south of our small island. Shortly thereafter one of them dropped a flare and began flying towards our island. They flew close to us and circled tightly around our two fires – we waved frantically and could make out one man in the doorway, waving back. They dropped another flare and flew off. We didn't quite know what to make of it – but we were very excited. Someone knew where we were.

An hour later, we heard the distinctive sound of a helicopter and looked up to see the powerful dual-prop Canadian coastguard rescue helicopter descending from the heavens. It settled on an outcropping of the shore and the side door opened. A jolly man win an orange rescue suit and a big white helmet emerged and approached, happy to find us alive and in good spirits. We boarded the helicopter and the pilot lifted off. He turned to us and asked, "Well, where

would you like us to take you?"

The aftermath of the excursion included many conversations with uncles and grandfathers about responsibility and safety. The lessons I took from that experience are about the power of the elements – and the insignificance of five vacationers within the larger thrust of our biosphere. But I also learned to respect the systems that we humans have created that allow us to find and rescue those same five vacationers. It took two airplanes and a helicopter to pluck us from that island. But it also took the tax payer dollars and the commitment of dozens of professionals who have devoted their lives to rescuing others. It took mapping and understanding wind directions. And it took compassion. When one of the adventurer's parents noticed that we hadn't returned by supper, they called the local police, who called the regional coast guard, who initiated the search around midnight.

We need to pay better attention. I needed to pay better attention to the knot I tied. We all should have paid better attention to the power of the wind. We should have had a back-up plan. We should have arrived on the island with better supplies. We should all pay more attention.

BACKGROUND

Humans have existed for four hundred million years. We have spread from one continent to all seven. We have survived ice ages and droughts, plagues and wars. Our planet's temperature is rising; our climate is changing. I believe that we will survive for another four hundred million years.

In 1879, my great-great grandfather, Lucien Wulsin, explored the headwaters of the Mississippi River in a canoe. When I was eighteen, I put our canoe on top of my car, picked up my girlfriend and drove down to the Ohio River. We paddled about half a mile downstream and wove our way between the yachts that had dropped anchor – turning the river into a parking lot of partying celebrants. It was Labor Day, and the local rock music station was sponsoring a massive fireworks show timed to music. Nobody was allowed past the Big Mac Bridge (Figure II.1) and the biggest yachts had arrived days earlier for the best seats. Our nimble canoe slipped between the large, loud, parties and found refuge under the piers of a riverside restaurant. We tied up the canoe and I pulled out a battery operated radio and we tuned to 102.7 FM. We lay in the bottom of the canoe, tied to a concrete pier surrounded by yachts under a bridge that was carrying eight lanes of interstate traffic across the Mason-Dixon Line, watching a fireworks show timed to music playing over my battery operated radio.

We began affecting our landscape eleven thousand years ago at the dawn of the agricultural revolution[1]. Like the beaver, we learned to make changes to our environment that increased at first our chances of survival and then, our standard of living. As technology has advanced, so too has our dominion over our planet. But this dominion is not infinite, despite many

1

religious traditions that separate man from nature as the caretaker.

Our biosphere extends from the depths of our oceans to the limits of our atmosphere and is affected by everything (Figure II.2). From left: Col. Joe Kittinger, a gondola at 102,800 ft above sea level, 1960 (photo by: U.S. Air Force); James Cameron, a submarine at 36,069 ft below sea level, 3/26/2012 (rendering by DeepSea Challenge); Felix Baumgartner, a capsule 128,100 ft above sea level, 10/14/2012 (photo by Alexandre Inagaki).

FIGURE II.2: Limits of the Biosphere

Our ability to extract fossil fuels from the earth's core, change the nitrogen levels in the ocean to promote algae growth which then kills all other forms of life, melt polar ice caps and eliminate mountains to harvest coal is both inspiring and terrifying[2]. But our ability to turn a burning river in Cleveland into a healthy ecosystem, to fill the streets of New York with automobiles that don't emit smog, to convert power from the sun and wind into electricity is inspiring and exhilarating.

Since the Industrial Revolution, we have generated incredible technology that empowers us to generate ecosystems, to build biodiversity, to reconstruct wilderness, and to improve the health of our planet. But in order to do so, we must reshape our consciousness. The

2 Gore, 2006.

technology we have today is the product of an Industrial Revolution mindset that places capitalist productivity at the center of progress. It defines success and wealth through the accumulation of goods and services. It converts the energy of fossil fuels into the economy of capitalist wealth[3].

The earth is always changing. Our seven continents used to be one. The Appalachian Mountains used to be taller than the Rocky Mountains. But the speed with which our earth has changed in the last two hundred years does not compare to anything we have ever experienced. The landscape Lucien Wulsin explored has been changed dramatically since he dipped his paddle in the water. The Industrial Revolution in the 19th century gave us the tools to shape our biosphere. In just a couple hundred years, we have learned to pull energy from the earth, use it to produce work, and change our lives in ways unimaginable to our ancestors. In what ways will we change the lives of our descendants?

Yes, we will survive for another four hundred million years. I do not know what our earth will look like in that time, though it is likely to be unrecognizable to us. I care about what the world will be like for my children, grandchildren, great grandchildren, and great-great grandchildren. The world created for us by Lucien Wulsin and his peers requires our compassionate and empathic management. I want my descendants to have choices about where they live and how they spend their free time. I want them to be able to canoe with their girlfriends, even if it is between yachts. I want them to walk in the woods and watch sunrises alone on mountain tops.

I am responsible for creating the world my grandchildren will inherit. I want to create a world in which success is defined by compassion; where the wealthiest are the most empathic. This is a world defined not by the accumulation of goods and services, but by the accumulation of values and connections.

In order to do this, we have to shift our consciousness. We need to pay more attention to the

3 Rifkin, 2011.

things around us. We need to notice where the sun rises, what happens when it rains, how the direction of the wind affects the amount of energy needed to keep our homes comfortable. We need to understand that where and how our food was grown affects how it tastes and how it keeps us healthy. We need to think differently about our responsibility to the other people in our communities, large and small.

CHAPTER 3:

PROPHETIC WORDS

In the next phase of human history, if we are to preserve our own species and conserve the planet for our fellow creatures, we will need to find a way to reintegrate ourselves with the rest of the living Earth.[1]

-Jeremy Rifkin

The twenty-first century has been defined by two global threats exaggerated by a third. The effects of the first two Industrial Revolutions have accelerated the rate at which Earth's biosphere is warming. Scientists predict a three degree Celsius rise Earth's temperature by the end of the century; a shift that could create a climate more similar to the Pliocene age. The other global threat is economic. In the first decade of the century, the world economy based on corporate profits, large-scale financial investment, widespread credit, and continuous top-down growth began to crumble. The collapse of economies in Greece, Spain, Detroit and Wall Street indicate the instability of the current economic structures that organize our society.

The environmental and economic crises are exacerbated by and lead to an ever increasing crisis of equality in which power and wealth (of many forms) are held by a shrinking minority. In the face of this three-fold catastrophe - a dénouement we seem ill prepared to prevent – Jeremy Rifkin presents his vision for a transforming paradigm that frames a Third Industrial Revolution with the convergence of renewable energy and the internet.

Rifkin's book, The Third Industrial Revolution: How Lateral Power is Transforming Energy, the Economy, and the World, presents his vision in five pillars. When substantial development of Renewable Energy, Buildings as Power-Plants, Hydrogen Fuel Cells, Interconnected Smart Grids, and Electric Plug-in Transportation coincide, the Third Industrial Revolution (TIR) will begin to take shape.

1 Rifkin, 2011.

Part of Rifkin's work has been to generate master plans for cities including Utrecht, San Antonio, Monaco, and Rome. Rifkin's team approached Rome by considering the Roman Biosphere. This required a profound commitment to "live out our individual lives in our neighborhoods and communities in ways that promote the general well-being of the larger biosphere."[2]

A TIR Master Plan for Rome repositions the first great city of Western civilization squarely at the center of environmental and economic revolution of the twenty first century. Addressing the Roman Biosphere meant thinking about the biological and geochemical processes that interact with each other to perpetuate life on Earth – and specifically life in Rome. The region is organized in rings surrounding the city center. An industrial and commercial ring extends to an open rural region designed for agricultural production. The integrated biosphere relies on zonal interconnectivity across a shared smart power grid fed by locally generated, renewable energy.

Renovating old commercial buildings in the city center into high-density residential will provide the space necessary to repopulate the urban core. Rifkin's plan includes pervasive small gardens including a project that places gardens in school yards across the city that are tended by students. The hub of Rome's economy lies in the industrial/commercial circle surrounding the urban center. Rifkin envisions technology parks similar to the one in Huesca, Spain, which produces its own renewable energy.

More than half of the space in the Roman Biosphere is dedicated as green space that, with the right management, could be much more agriculturally productive. Making the region successful will require thousands of small farms implementing progressive farming practices that revitalize the deficient soil.

Learning about the TIR months after my peers occupied Wall Street and generated a dynamic horizontally-structured movement allows me to make connections between the aspirations of

2 Rifkin, 2011.

my generation and the challenges that face us. The TIR will empower all of us to participate in making our world a better place.

The Third Industrial Revolution focuses on the political and economic aspects of the next forty years. Issues including education, social structures, equality, and environmental engagement are not addressed. How does the existing educational system support and foster a hierarchical, vertical organization of politics and the economy? What educational models would foster distributed collaboration? How does the internet, and specifically social networks, affect the organization of social groups? How do we transition from a system of extremes in wealth, education, health, and access to a system of equality? And what role does engagement with environmental systems play when fostering biosphere consciousness?

Consciousness shifts when communication systems and energy regimes shift. (Figure 3.1) Rifkin identifies five major dynamics of consciousness throughout history. This last form, Biosphere Consciousness, is expansive and integrated and requires all of us to wrestle with our place in the interdependent web of existence of which we are a part.

When energy regimes converge with communications revolutions, human consciousness is altered.
–Jeremy Rifkin, *The Third Industrial Revolution*

Energy regimes	Communication systems	Consciousness
Hunter-Gatherer	Oral Tradition	Mythological
Hydraulic Agricultural	Handwriting	Theological
Coal & Steam	Print	Ideological
Oil & Internal Combustion	Electronic Media	Psychological
Distributed Renewables	Collaborative Internet	Biosphere

Figure 3.1: Human Consciousness

Terra Preta

In Walden, Henry David Thoreau writes, "In Wilderness is the preservation of the World." This attitude that the world is better off without us than it is with us is a reaction to the shortsighted disregard for the effects of our actions on our environment. Charles Mann connects this attitude to the Judeo-Christian tradition of original sin and the guilt associated

with simply existing on this planet. He points out that the rest of the world frames their relationship with their surroundings as empowered shapers of the future.[3]

Our relationship to Earth's resources tells a compelling narrative about the sustainability of our civilization. Throughout history, civilizations that have disregarded the long-term effects of their consumption have eventually collapsed. We are at the brink of feeling this collapse again as the demand for oil out paces the production and availability of oil. Though the production, extraction, and consumption of oil take place on a much larger and global scale, the story is essentially the same as the story of dirt.[4]

Both dirt and oil are sources of energy. Dirt is necessary for the production of food and oil is necessary for the production of work within the internal combustion engine. The timeline for dirt, however, and the feedback loop is smaller. A community that disrespects its soil can eliminate the agricultural productivity of its land in a few generations. The reverse, however, is also true: that generating healthy, productive soil is a relatively quick process.

In the Amazon Rainforest, an area regarded as wild, the native soil is quite poor for sustained agriculture. The hot, wet conditions produce a thick layer of organic material that quickly regenerates plants. When a rainforest is cleared for farms and ranches, the remaining soil lasts only a season or two before the farmer has to move further into the rainforest for more soil. Most of the rainforest's nutrients are in the plants, not in the soil. But in this "wild" rainforest, the Beni people have learned how to turn the unusable dirt into some of the best growing material the world has ever known. Terra Preta is made from broken ceramics, organic debris, high charcoal, excrement, organic waste, fish, animal bones, and human urns. The Beni is one of humankind's greatest creations: a fully diverse and productive ecosystem. This human-made dirt helped the Beni live within the rainforest and farm the same land for thousands of years.[5]

---

3 Mann, 2005.
4 Montgomery, 2007.
5 Mann, 2005.

It appears that our story in North America will be very different. Agricultural history in the United States is directly linked to the social, political, and economic history of our country. In the decades leading up to the Civil War, the difference between dirt of the North and the South led to significant economic disparities. New England's agriculture was diverse because tobacco and cotton didn't grow well.[6]

There was no crop that grew well enough to produce an export-based economy. Land more suitable for large scale export-based agriculture was found in the South and as the economy become more and more dependent on it, preservation of the soil became less and less important – eventually leading to the collapse of the southern economy and, in part, to the Civil War. The spread of slavery was the South's economic solution to land that couldn't produce any more cotton or tobacco.

The Plains of the Midwest are as important a contributor to the explosive growth of the industrial revolution as anything. Kansas, Nebraska, and the Dakotas are the best agricultural lands on earth – created by ancient dirt pushed south by glaciers during the ice age and then spread by the high winds coming off the ice fields. The Great Plains grass had super thick roots that plows couldn't cut through so early settlers kept moving west. In 1838, however, John Deere invented a steel plow that could till the planes and this began an agricultural boom that set the stage for the industrial revolution during the second half of the nineteenth century. New plows meant that capital replaced labor as the limiting factor in agricultural growth.

In addition to capital, the separation of agricultural producers from agricultural consumers required an enormous transportation infrastructure. The construction of the intercontinental railroad system connected the farmers of the Midwest with the consumers in the cities on the East Coast. The railroad system required unprecedented investment and management and transformed the stock exchange in New York into the primary economic engine of our

6 Montgomery, 2007.

country.

The new economic system that separated ownership from management contributed to today's incomplete feedback loop (Figure 3.2). Consumers do not experience or understand the effects of their consumption because we are removed from the production processes.

The elongated economic structure required communication vertically along the hierarchy. Managing national infrastructures like the railroad relied on print communications and built the first literate workforce in the world. The increased literacy of the nineteenth century allowed the railroad companies to centralize ownership and power while spreading management across the country. At the end of the nineteenth century, railroad companies had a much larger grasp on the country's economy than the government.

The Pennsylvania Railroad Company alone employed almost three times as many people as the U.S. Military and this single company's annual income was more than a third of the entire U.S. Governments (Figure 3.3). This highly concentrated wealth and vertical organization of power has led to the dramatic and devastating disparity of wealth our society is faced with today.[7]

Corporate structure separates ownership from management

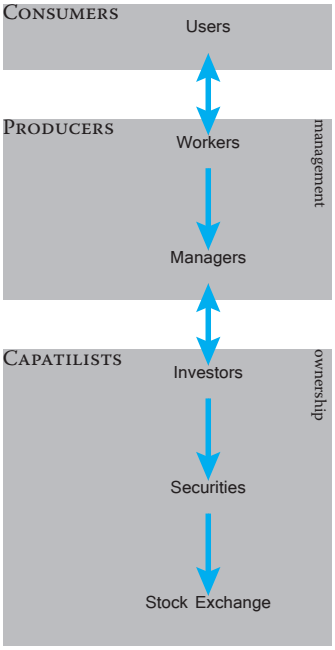
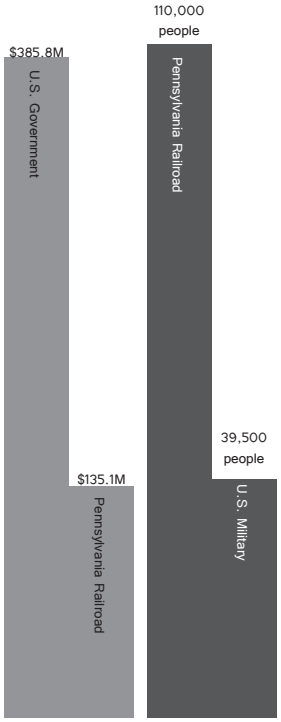


Figure 3.2: Corporate Structure



Relative size of Pennsylvania Railroad Company in 1890

Figure 3.3: Size of the Pennsylvania Railroad

7 Rifkin, 1991.

Heroes Falling

When I first read the Romantics, I knew I had found my muses; Emerson, Thoreau, and Whitman, spoke to my teenage craving for freedom and the outdoors. When I first walked through the Muir Woods north of San Francisco I felt John Muir's legacy beneath my feet. Visiting Yellowstone, Badlands, and Acadia demonstrated that Theodore Roosevelt's national park system was one of the greatest achievements of his - or any - presidency.

But after reading Joel Sanders's essay, "Human Nature: Wilderness and the Landscape/ Architecture Divide," I am questioning my heroes. Though Sanders frames the essay around the divide between the Architecture and Landscape Architecture professions, his message is much broader. Sanders traces the roots of today's ecologic disconnect to the philosophies of the 19th Century Enlightenment. The Romantic view of wilderness as the canvas on which Man could exercise his dominion has evolved into a dangerous relationship in which Nature is separate from Man.[8]

I am the first candidate to earn dual master's degree in Landscape Architecture and Architecture at a public university in New England. This is remarkable only in the difficulties it has illuminated. At the University of Massachusetts, the Masters of Landscape Architecture program emerged from the College of Natural Sciences as an outgrowth of Frank Waugh's expertise in gardening and horticulture. UMass was founded as an agriculture land-grant school and landscape studies have been deeply rooted within the science of ecology. Architecture, on the other hand, emerged from within the College of Humanities and Fine Arts as an outgrowth of the Interior Design Program and its pedagogic home is with the arts.

As Sanders repeatedly points out, we are at a tipping point in which the integration of science and art - and landscape and architecture - has never been more crucial. Landscape Architecture in the 20th century suffered from a lack of visionary design while Architecture suffered from a lack of ecologic awareness and application. Sanders's essay, published in the

8 Balmori and Sanders, 2011.

beginning of the Seminal work, Ground Work, comes after the first decade of the 21st century which saw the Architects begin applying landscape lessons and ecologic practices to the built environment; he calls on Landscape Architects to provide similar leadership going forward.

Who will take the lead is still a question that indicates how deeply embedded the dichotomy is between Landscape and Building. Sanders identifies the two disciplines as having to work together to achieve a stronger relationship between land and building.

I propose a simpler solution, which requires the promotion of generalists above specialists. A single field dedicated to how our society interfaces with the biosphere around us would need to pull knowledge from all disciplines. Everyone would be welcome at the table and the discussion is led by someone who can hold the various points of view together. The basic premise is that what we do while on this earth should enhance all of the systems in which we participate. That is a lofty goal and I don't know exactly how to do it – but we should be net producers, not net consumers. If we can produce natural resources like soil, plants, and carbon storage devices like trees, and biodiversity, and cultural awareness, and equality, and accessibility, then we can create a better world for the future.

The Romantics of the 21st Century must embrace the complexities and contradictions of our current momentum and begin a new paradigm in which we see the Earth as an integrated system of interdependence.

View from Mount Holyoke, Northampton, Massachusetts, after a Thunderstorm (Figure 3.4), a painting by Thomas Cole often known as *The Oxbow* illustrates the collision of wilderness with cultivated farmland. Cole articulates this collision with dark storm clouds that could be seen as indicating the impending collapse of human's relationship with nature.

The Oxbow was painted in 1835. Deforestation of New England would peak over the following fifty years and the absence of wilderness in the East would turn naturalist's eyes westward.

Figure 3.4: The Oxbow

Roosevelt visited Muir in 1903 at Yosemite Valley (Figure 3.5) and this picture depicts two of the most influential decision makers who have shaped the 20th century's approach to wilderness, nature, and preservation.

Figure 3.5: Roosevelt and Muir, Yosemite National Park, 1906

CHAPTER 4:

THE WEB

We live on a magnificent planet and no matter what your understanding of creation may look like, it is breathtaking. Carl Sagan articulates this understanding in his response to the Pale Blue Dot photograph. In his book by the same name, he writes,

> *"How is it that hardly any major religion has looked at science and concluded, "This is better than we thought! The Universe is much bigger than our prophets said, grander, more subtle, more elegant?" Instead they say, "No, no, no! My god is a little god, and I want him to stay that way." A religion, old or new, that stressed the magnificence of the Universe as revealed by modern science might be able to draw forth reserves of reverence and awe hardly tapped by the conventional faiths."*[1]
>
> *-Carl Sagan*

The Pale Blue Dot (Figure 4.1), it is the photo that Voyager I took on its way out of our solar system in 1990. This photograph, which is mostly black, has diagonal bands of color, which are beams from our sun. Within one of these beams is a tiny, blue, dot: Earth – our home, surrounded by an infinite void.

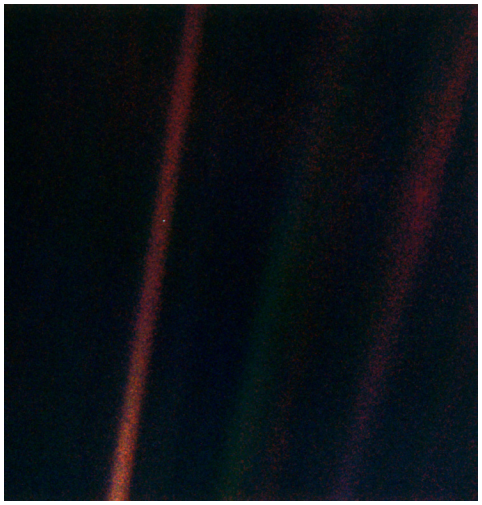


FIGURE 4.1: Pale Blue Dot

1 Sagan, 1997.

The Pale Blue Dot is one stop on a lineage that includes Copernicus' establishment of the sun as the center of our solar system and Newton's discovery of universal laws of physics. It includes Earthrise, the photo taken from Apollo 8 in 1968 of Earth rising above the surface of the moon. It includes Darwin's theory of evolution and the discovery of Lucy in Ethiopia. It's a journey that, over the past tens of thousands of years, has allowed us to understand our place in the universe as relatively small and perhaps, insignificant.

FIGURE 4.2: Earthrise, 1968

But there is another journey that humans have embarked upon. And this journey begins 100,000 years ago when humans began using language to communicate. It includes technological developments like the irrigation ditch, the plow, paper, and wheels. It includes Gutenberg's printing press and Bell's telephone. It includes Edison's light bulb and Morse's telegraph, the Pony Express, transcontinental railway, GPS, the internet, Google earth, e-mail, and yes, even Facebook.

The first journey is a journey that frames our existence within an unfathomable continuum.

The universe has been here for a long time and it is going to be here a long time. No matter what we do.

The second journey, on the other hand, is about connection. It may be somewhat myopic, but I find it much more accessible. It is a journey in which we have expanded our ability to connect to each other. When faced with the unfathomable continuum within which we exist, it is comforting to ask the question, what about us? What about now? This is an instant in a timeline that began billions of years ago and will continue for billions of years in the future. This is an instant that we get to share on this tiny blue dot in the midst of an infinite void. What are we going to do with this moment?

In Nature and the Idea of a Man-Made World, Norman Crowe examines the separation of mind and soul from matter and the natural world. He suggests that the thresholds this dualism led to include Copernicus, Newton and Darwin. "While these ideas and discoveries eventually brought us back to the realization that we are indeed integral with nature, it also brought us the industrial revolution, which further distanced us from an intimate sense of our own presence in some kind of natural order. We learned to hybridize crops, turn iron ore into automobiles, and change coal into electricity and this has encouraged us to continue to view the natural world as something to exploit freely and has permitted us to structure our daily lives in ways that further distance us from nature."[2]

In the second half of the nineteenth century, as the Industrial Revolution was dramatically reshaping the landscape, the Romantics added to this dualism by celebrating the purity of untouched nature. This sacred wildness, according to Thoreau, would exist "for the protection of some life pasturing freely where we never wander."[3]

But this paradigm doesn't work anymore. In a political, economic, and social society characterized by extreme polarity, pitting Romantic environmentalists against greedy

2 Crowe, 1995. p22
3 Thoreau, 1854.

industrialists only furthers the rift between our soul and nature. And that is a rift that won't survive the 21st Century. We need to synchronize ourselves with our surroundings before it is too late. We need to find harmony between our soul and nature.

Our biosphere is the 3.5 billion year old all-inclusive sum of the systems that support life on our planet. It includes all ecosystems, the atmosphere, hydrosphere, and lithosphere. With the notable exception of the sun's energy, it is a closed loop, somewhat self-regulating system that has promoted life for a very, very long time. Humans, of course, have only been around for a tiny fraction of that, just over two million years, and for the majority of that, we interacted with the biosphere pretty much the way other mammals did. Humans have always been like the beaver and changed their environment to meet their needs, but about 10,000 years ago (half a percent of the two million years we've been around), we shifted from hunter gatherers and began farming. We learned to dwell. Since then, humans' ability to alter our environment has grown exponentially. The dualism that Crowe wrote about has allowed us to see our environment as something separate from ourselves, and therefore "as something we might control and exploit for our own benefit." But in the nineteenth century, we discovered that we could burn coal to power steam engines. As our energy source shifted from wood to coal, and then to oil, humans experienced an unprecedented change in the way we lived on this planet.

The systems that make up our biosphere have been operating under the same rules for far longer than we have been around. However, humans have learned how to manipulate these systems in awe inspiring, if not terrifying, ways. We have removed mountaintops in West Virginia to turn coal into electricity, carved canals through Panama and Egypt to connect oceans and seas that had forever been separated. We reforested and deforested and reforested the North American East Coast. We terraced Southeast Asia and turned unfertile mountainsides into productive farms. We plowed the great plains of the American Midwest and put so much dust into the atmosphere the sky darkened in Washington D.C. We polluted

countless streams and lakes and turned rain into acid. We lit the Cuyahoga River on fire. We filled New York City with so much pollution you couldn't eat outside.[4]

And then we cleaned up the Cuyahoga River. And we passed the clean air act. And New York's air quality has never been better. The Cuyahoga River is now a viable ecosystem.

We have the ability to destroy ecosystems. But like the beaver that regulates water levels and creates thriving wetlands, we also have the ability to create ecosystems. We know how to warm our climate; which is pretty incredible. We also understand what it would take to cool it.

I have mentioned the extraordinarily eternal timeline of our planet, and I must admit that I don't have a clear opinion about what our world should be like in a thousand or ten thousand or a million years. I can't summon compassion for life in another era. What I am concerned with, however, is the tiny moment that we get to share on this planet. It's okay to be selfish – in fact, it is an evolutionary requirement. The question then becomes, what kind of world do I want to live in? While I can't imagine the world in a thousand years, it is easy for me to look into the near future and realize that I care a lot about the kind of world my children grow up in, and definitely my grandchildren. Things get a little fuzzier when I get to the next generation and somewhere around four or five generations in the future, I stop being able to empathize, to really commit myself to their lives. And that's okay because the moment I'm trying to define lasts about a century. I don't really know what life in the twenty second century will look like, but I have an opinion about what life in the 21st century should look like.

At the rate we are going, my grandchildren could grow up in New England surrounded by palm trees instead of maple trees. So what? I could be okay with that if we as a society decided, given all the information that we had and understanding all of the implications that that would entail, that that is what we wanted. My problem is that I haven't heard anyone who knows what they're talking about say they believed this would be a good thing. And yet, we as

4 Mann, 2011.

a group seem to be making decisions that none of us as individuals would ever make.

What will it take for us to embrace the responsibility we have for creating the world we want our grandchildren to inherit? I believe that it will take a new way of thinking, an expanded mindset, an empathic, biosphere consciousness that places us squarely in the middle of the complex interdependent web of which we are not only a part, but of which we have unprecedented influence.

Road Map: Education, Expression, Experience

Our consciousness is the gestalt effect of what we know, what we feel, and what we believe. This trinity of education, expression, and experience provides a roadmap for action.

Education: expand what we know through aggressive research and education. Each one of us needs to learn the science of climate change, the ecology of our regions and the hydrology of our watershed. We have a responsibility to know how to grow vegetables and design houses that don't function without heating or cooling systems. We need to teach each other about how we understand our biosphere.

Expression: cultivate values and opinions. It is one thing to understand the science behind climate change, but it is quite another to have an opinion about it. It is one thing to know that the earth's tilted axis results in the changing of the seasons, but it is quite another to feel something about it. To cultivate opinions, we need artistic expression. Art is the only way to communicate feeling and emotion without having to translate it into an intellectual experience and then back into an emotional one. Expression through music and dance and photography and poetry and painting and video and sculpture and theater will continue to shape our collective consciousness from an emotional core.

Experience: experience the awe and reverence of our Earth. Being a part of this web is a magical experience, and we can't afford to miss the wonder and splendor of every moment. Building biosphere consciousness requires experiencing the biosphere.

Like the Maasai men, we need to pay more attention. We need to notice the way the wind ripples through leaves on a birch tree; the delicate veins on an over ripe cherry tomato; the sparkle of stars in the night sky or the depths of clouds on a summer day. We could slip into a cool stream on a hot afternoon and feel the water that has descended from mountains miles away; witness the first moments of day as the sun peaks over the horizon. We are surrounded by excuses for inspiration – let us experience them.

TOOLKIT

Through conceptual exploration, a toolkit of strategies emerged that, when combined, build empathic consciousness toward our biosphere.

The conceptual exploration provided material evidence of philosophic questions. The evidence does not suggest answers. Rather, it provides a transition from idea to form that transcends the literal.

Conceptual explorations include:

Expand and Inhabit the Threshold

Embrace Liminality

Reveal Process

In addition to conceptual explorations, understanding the broader context is crucial to expanding and shifting consciousness. Historic, cultural, socio economic, and topographic characteristics create the foundation for a successful design proposal.

CHAPTER 5:

CONCEPTUAL DESIGN

We learn about the relationship between things at the threshold between them. Liminal space is an in-between state. Dawn is the liminal space between night and day; brackish water flows in the liminal channels between rivers and oceans; adolescence is the liminal age between childhood and adulthood.

FIGURE 5.1: Array of Conceptual Models

Expand and Inhabit the Threshold

To begin the physical exploration of liminality, I began by examining the threshold between solid and void. First, I built a collection of 4"x4" particle board cubes. For these experiments, I wanted a uniform shape that would allow me to focus on the materials and how spaces were shaped by solid and void. To build the forms, I cut a stack of 4" x 4" x 3/4" pieces of particle board. I then cut four-times as many pieces that were 4 3/4" x 5 3/4" with two mitered edges. (Figure 5.2) Held together with rubber bands, these pieces created a 4" cube void. (Figure 5.3)

FIGURE 5.2: Particle Board Forms

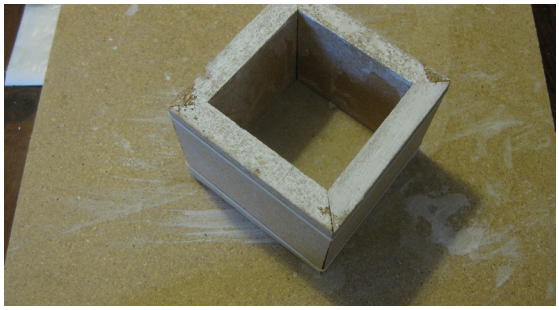


FIGURE 5.3: Rubber Bands Hold Form Together

Once establishing this 4” cube as a framework for the experiments, I defined a palette of materials that exposed the threshold between controlled design, and accidental - or unintentional - form making. These materials have an innate logic that limits the extent to which I can manipulate them. I chose ingredients that changed states at different speeds and reacted to moisture in different ways. The supplies needed for experiment #1 included starch based packing peanuts, paraffin wax, spinach, eggs, flour, wax dye, carrots, rubber bands, peanuts, honey, a sauce pan, plaster of paris, shellac, sugar cubes, and a bag of ice. (Figure 5.4)

FIGURE 5.4: Solid-Void Experiment Supplies

The first iteration of the experiment involved filling the form with packing peanuts and then pouring plaster of paris on top to fill the voids. (Figure 5.5)

FIGURE 5.5: Packing Peanuts and Plaster of Paris

FIGURE 5.6: The Results of Peanuts and Plaster

Once released from the form, the peanuts and plaster yielded a split topography of solid plaster surrounding decaying peanuts; the peanuts slowly dissolve over time. (Figure 5.6)

The next iteration involved ice cubes and paraffin wax. (Figure 5.7 - Figure 5.9)

FIGURE 5.7: Ice Cubes Fill the Form

FIGURE 5.8: Wax Covers Ice

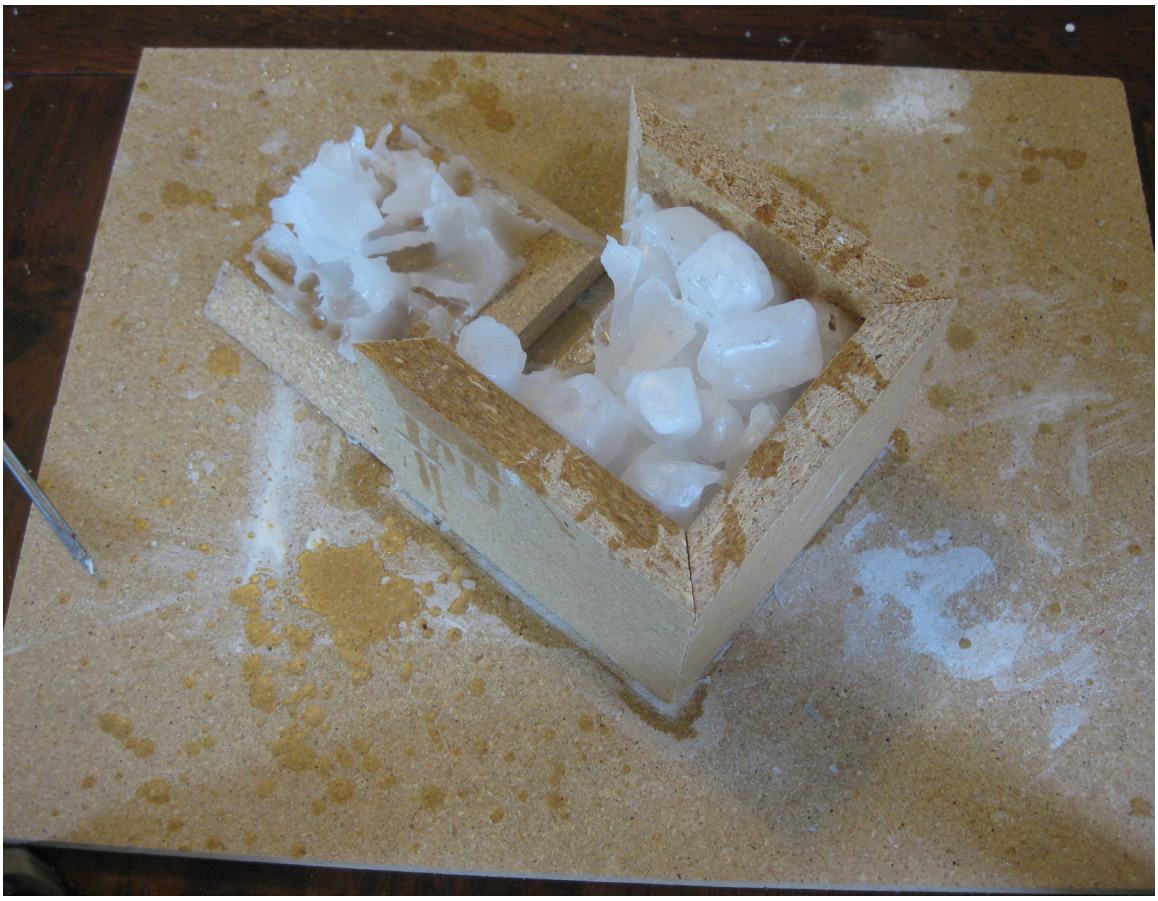


FIGURE 5.9: Wax Holds the Form Together

In this iteration, I learned that the wax adheres to the form and it is impossible to cleanly separate the two. However, I also discovered that wax's ability to hold light and form closely around the ice cubes yielded a very compelling condition.

Embrace Liminality

The first experiment yielded successes in the interstitial spaces of the wax and ice model. To learn more about these spaces, I focused the second experiment on enhancing these spaces. Lining the particle board form with wax paper allowed me to remove the wax object from the form intact. Photographing the wax object under light began to reveal a glowing ethereal condition.

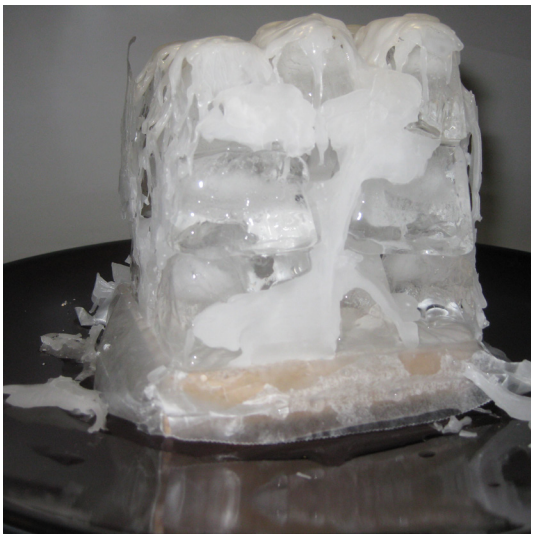


FIGURE 5.10: Wax Over Ice

FIGURE 5.11: Glowing

FIGURE 5.12: Glowing 2

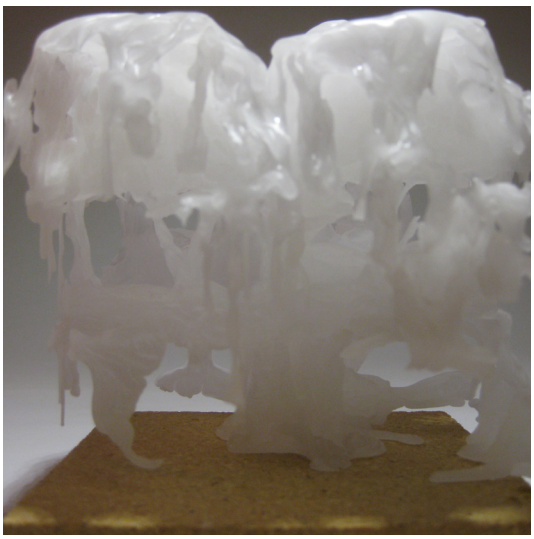


FIGURE 5.13: Framework

FIGURE 5.14: Depth of Field

FIGURE 5.15: Depth of Field 2

FIGURE 5.16: Folds

FIGURE 5.17: Cavity

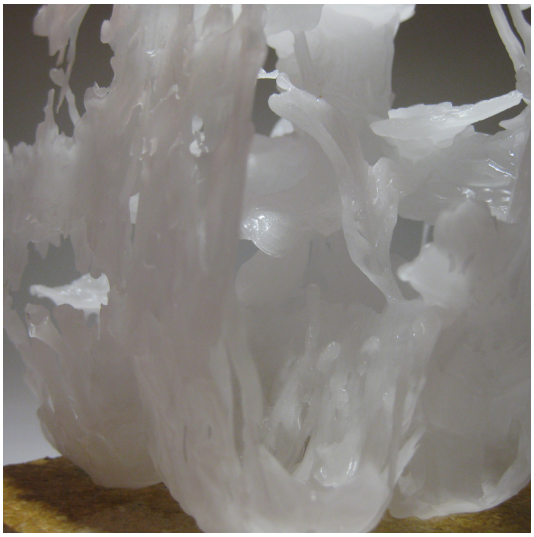


FIGURE 5.18: Cascade

Reveal Process

Allowing the process to be revealed in the product illustrates connections to the past. Like Zumthor's work in Switzerland (Figure 5.19) in which the formwork for a concrete chapel was burnt away, experiments using formwork, fire, and rock-ite reveal process (Figure 5.20 - Figure 5.22).

FIGURE 5.19: BruderClauseChapelZumthor

FIGURE 5.20: Emergent Flames

FIGURE 5.21: Rockite Burning

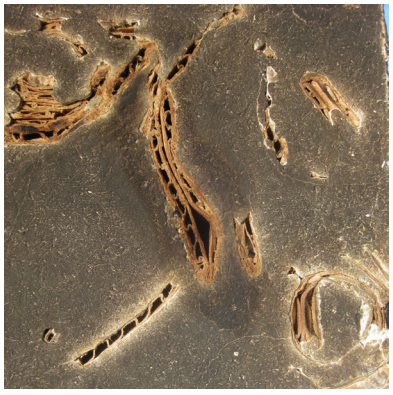


FIGURE 5.22: Emergent Texture

CHAPTER 6:

UNDERSTANDING CONTEXT

Cultural Landscape

Holyoke is a cultural landscape that tells the story of an industrial consciousness that reshaped natural systems for human benefit. The city owes its existence to the natural resource of the Hadley Falls in which the Connecticut River drops 60 feet. The Holyoke Water Power Company built a dam to harness the water power and divert some of the river through a network of canals through the city (Figure 6.1 & Figure 6.2).

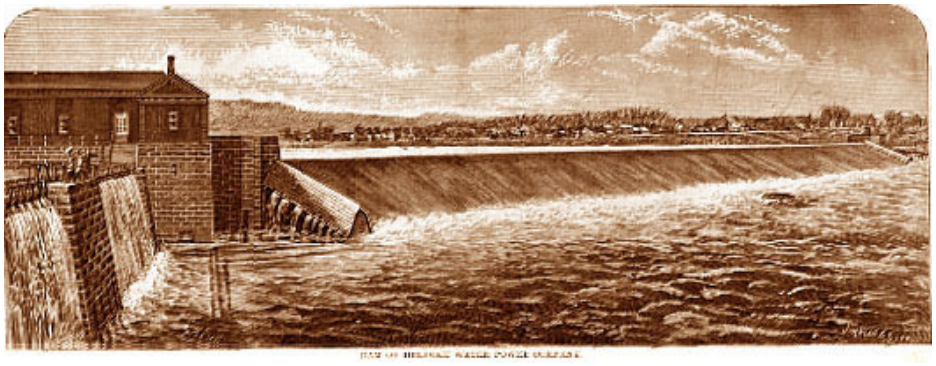


FIGURE 6.1: Dam at Hadley Falls

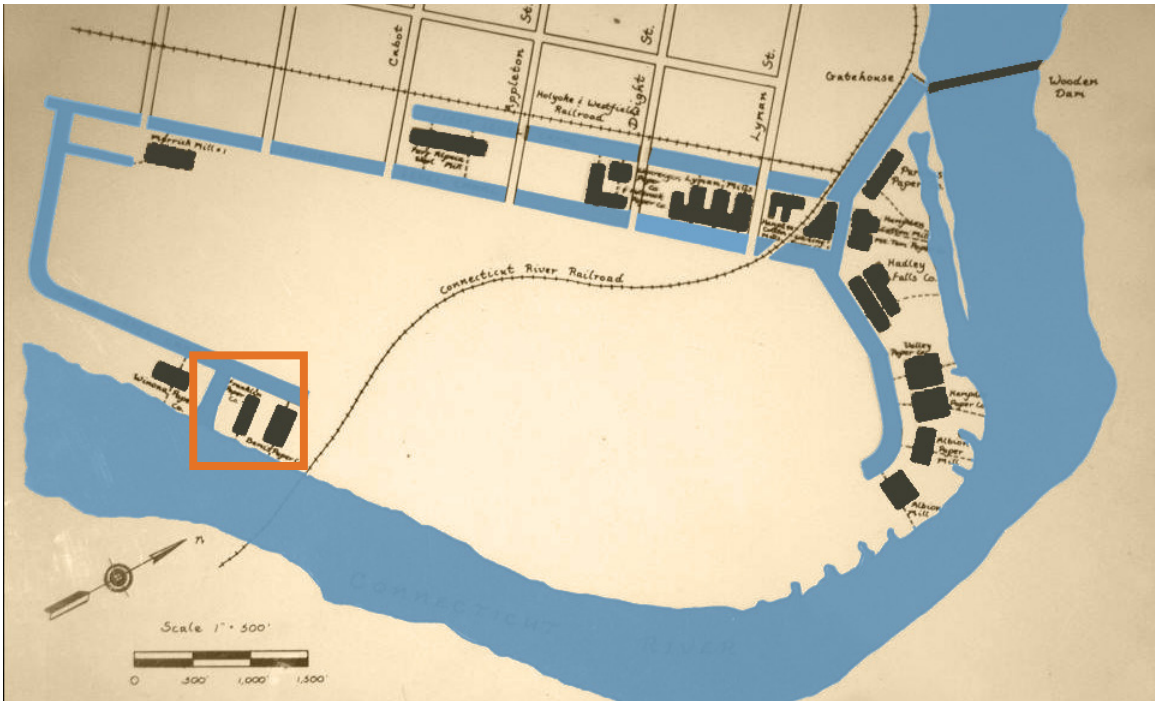


FIGURE 6.2: Canal Planning Map, 1880

Holyoke is the first planned industrial city in the world. Built by wealthy investors to utilize all of the greatest technological and management developments of the Industrial Revolution, the population and economy of Holyoke exploded at the end of the nineteenth century and beginning of the twentieth century (Figure 6.3).

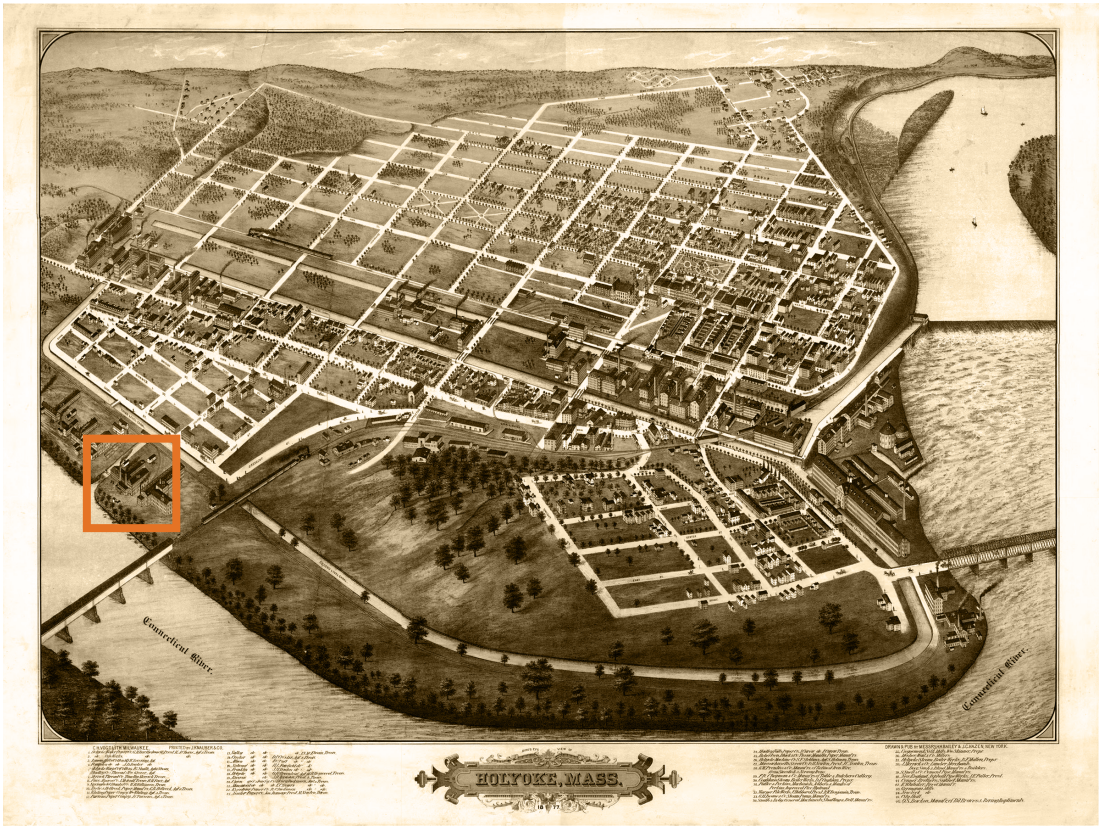


FIGURE 6.3: Holyoke, 1887

But it's success was short lived and after World War II, manufacturing jobs began leaving the city. By the 1960's, barely any of the mills and factories were still operating and since then, the economy has been shrinking.

Though Holyoke can be read as a product of the Industrial Revolution, it can also be the canvas on which a new paradigm is built. "The fundamental premise for examining culture in landscape ecology is that culture structures landscapes. A corollary premise is that landscapes inculcate culture."[1] (Nassauer, p. 229)

This thesis is based on the corollary premise.

1 Nassauer, 1995

The Image of the City

Holyoke is situated at an oxbow in the Connecticut River. The bend in the river has left a relatively flat area suitable for large industry while reserving the foothills for smaller residential. Mt. Tom rises to the north and defines the skyline and extent of buildable land. The distribution of buildings has a close relationship to the topography and is evident when the two rhythms are overlaid (Figure 6.4 & Figure 6.5).

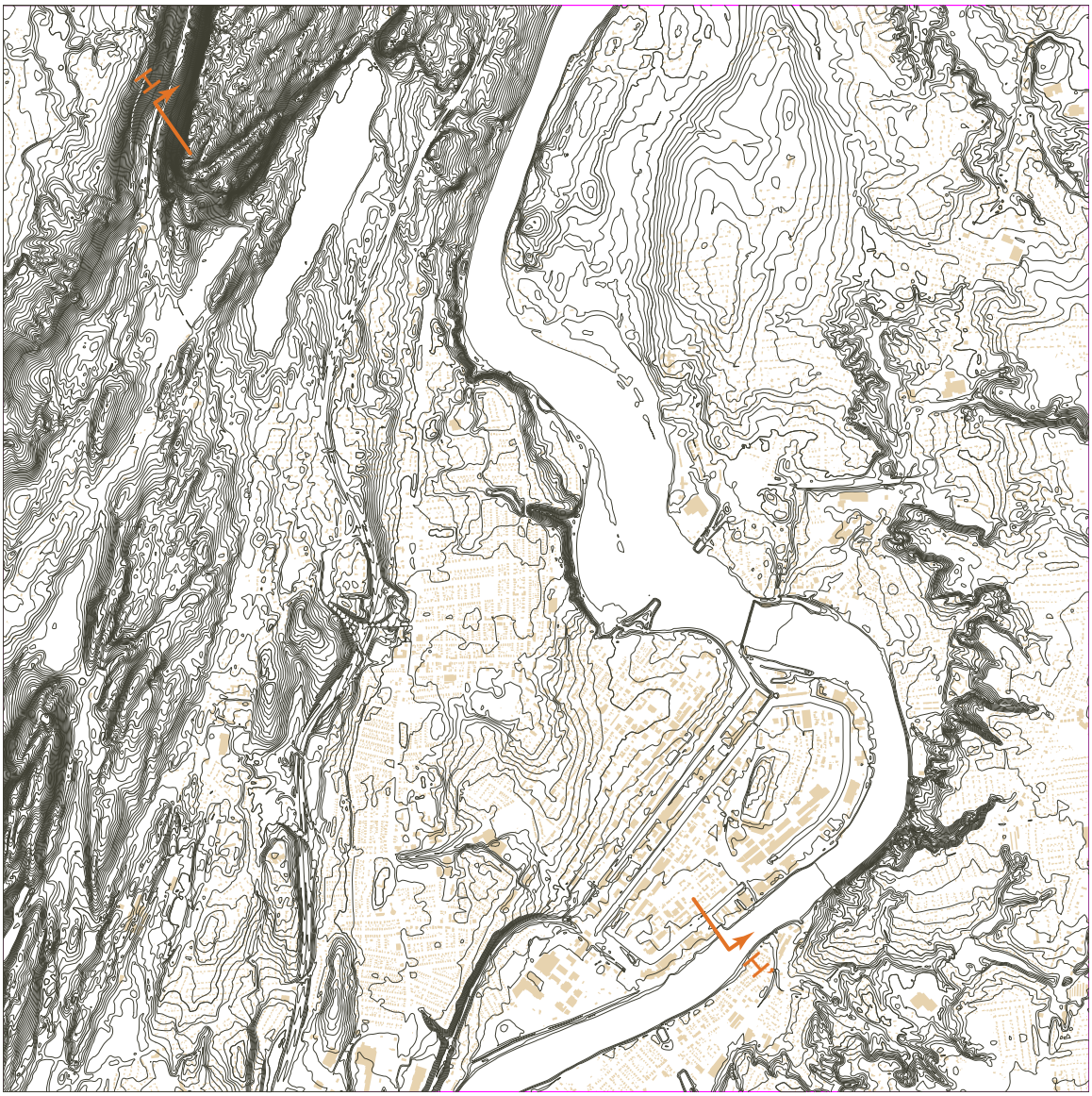


Figure 6.4: Holyoke Topography

Figure 6.5: Section H-H' from Mt. Tom to the Connecticut River

Holyoke is a city with well defined edges (Figure 6.6). The Canals and River form hard edges, the industrialized strip between the Third Level Canal and the Connecticut River creates a thick buffer which separates the River from the South Holyoke and The Flats.

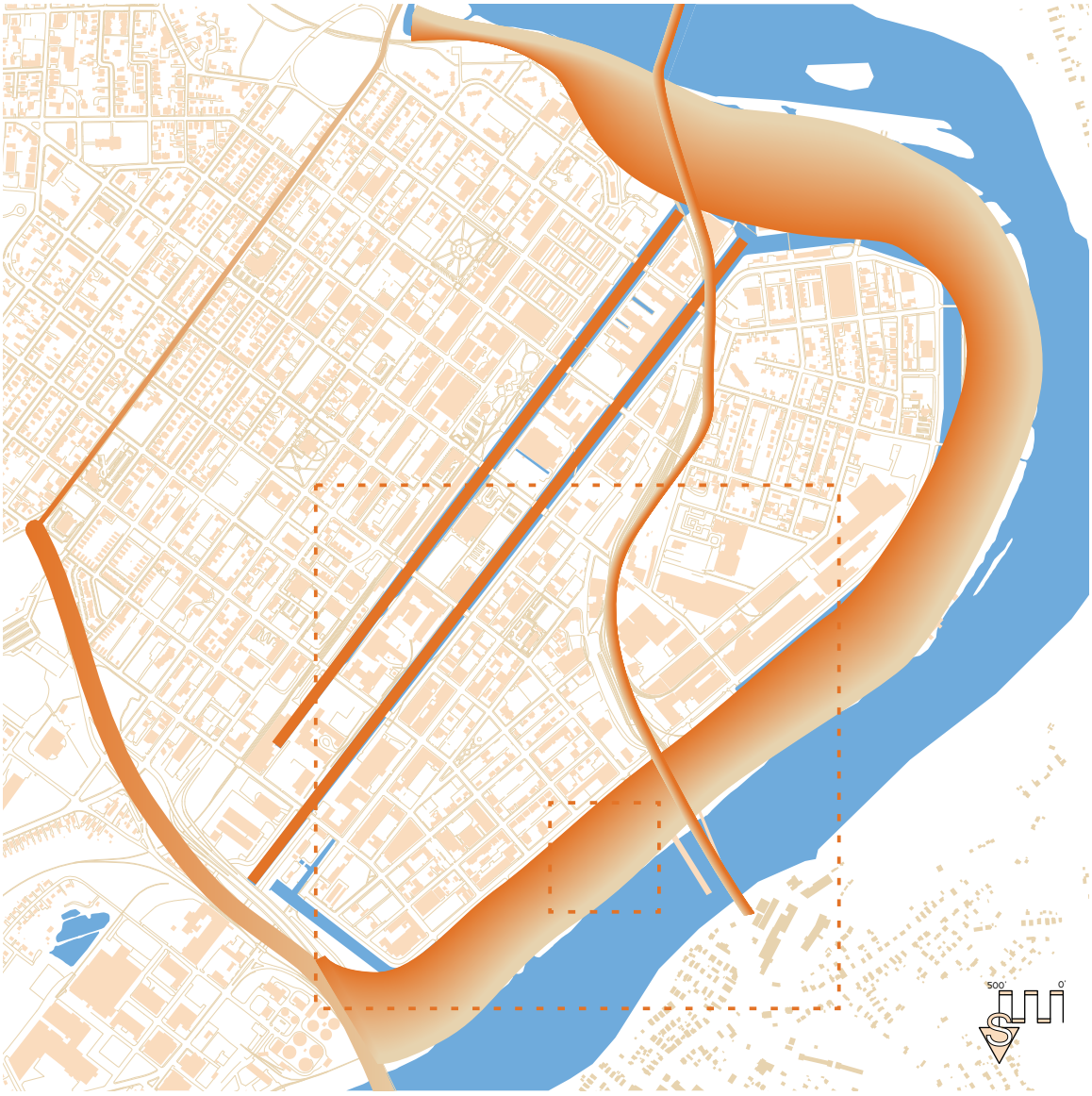


FIGURE 6.6: Holyoke City Center - Edges

The railroad corridor that separates South Holyoke from the Flats extends south through Chicopee toward Springfield and north along the Connecticut River to Northampton, Greenfield, and Vermont.

Beech Street is a cultural edge that separates the four City Center neighborhoods, which are predominantly Hispanic, from the highland neighborhoods which are predominantly white. In a community forum in October, I heard a Puerto Rican woman describe Beech Street as the edges of her city - and that when she was growing up, when people got rich, they moved to the other side of Beech Street. She dreamed of a time when rich people would stay in City Center.

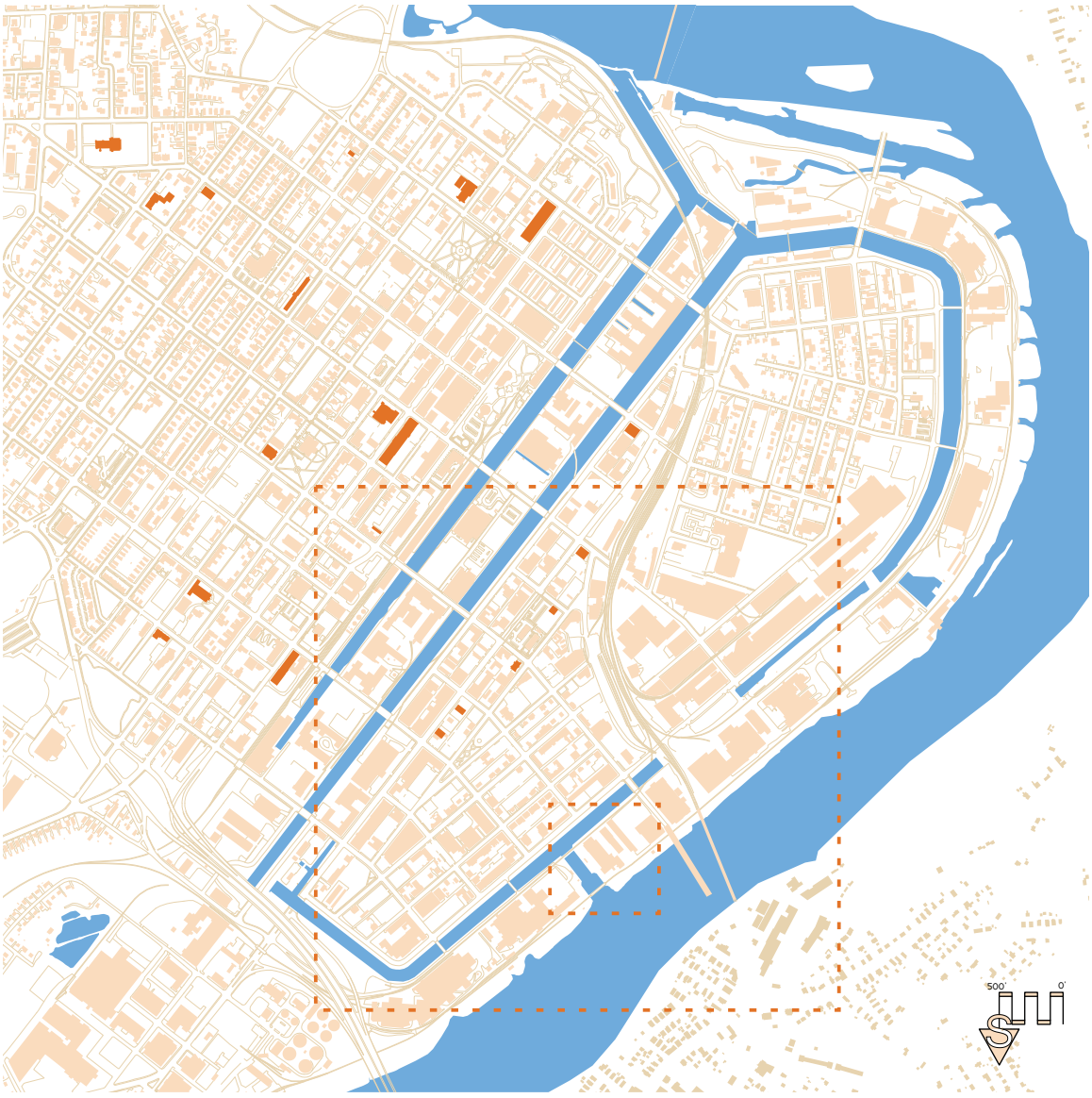


FIGURE 6.7: Holyoke City Center - Churches

The distribution of churches throughout the city (Figure 6.7) is one indication of the social and cultural void along the riverfront.

Since the 1960's, industry in Holyoke has been declining. Many of the factories have shuttered their doors and abandoned buildings across the city have been identified by the Department of Planning and Economic Development for demolition (Figure 6.8).

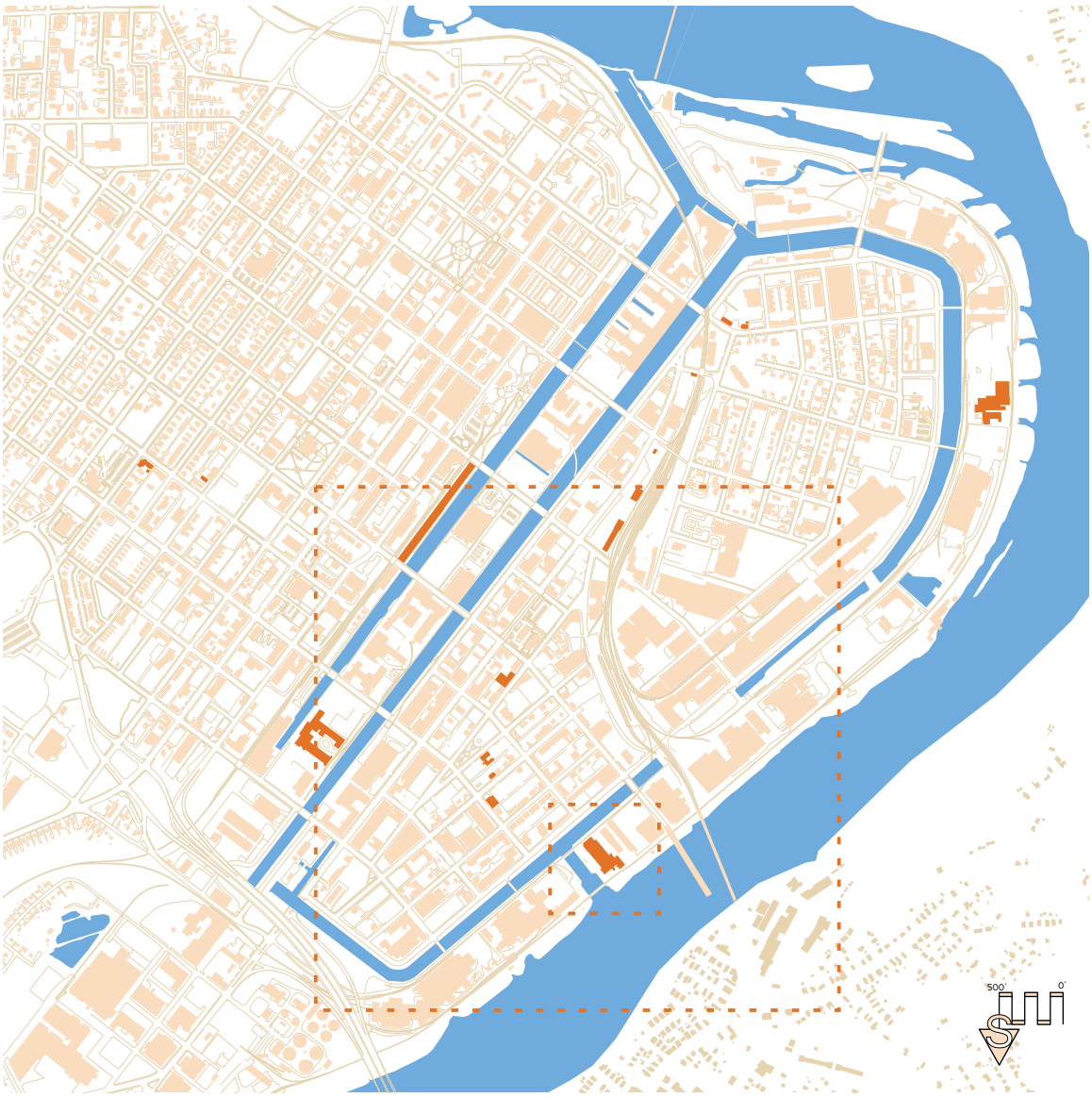


Figure 6.8: Holyoke City Center - Buildings to be demolished

The City Center consists of four neighborhoods, Prospect Heights, Churchill, The Flats, and South Holyoke. South Holyoke is the poorest of the neighborhoods and has one of the highest crime rates in the state[2].

South Holyoke is a largely residential Puerto Rican community with high unemployment and

2 Plaisance, 2013.

poverty. 88% of the population of 2,718 is Latino; the unemployment rate is 19%; and 42% of the households are led by a single mother[3].

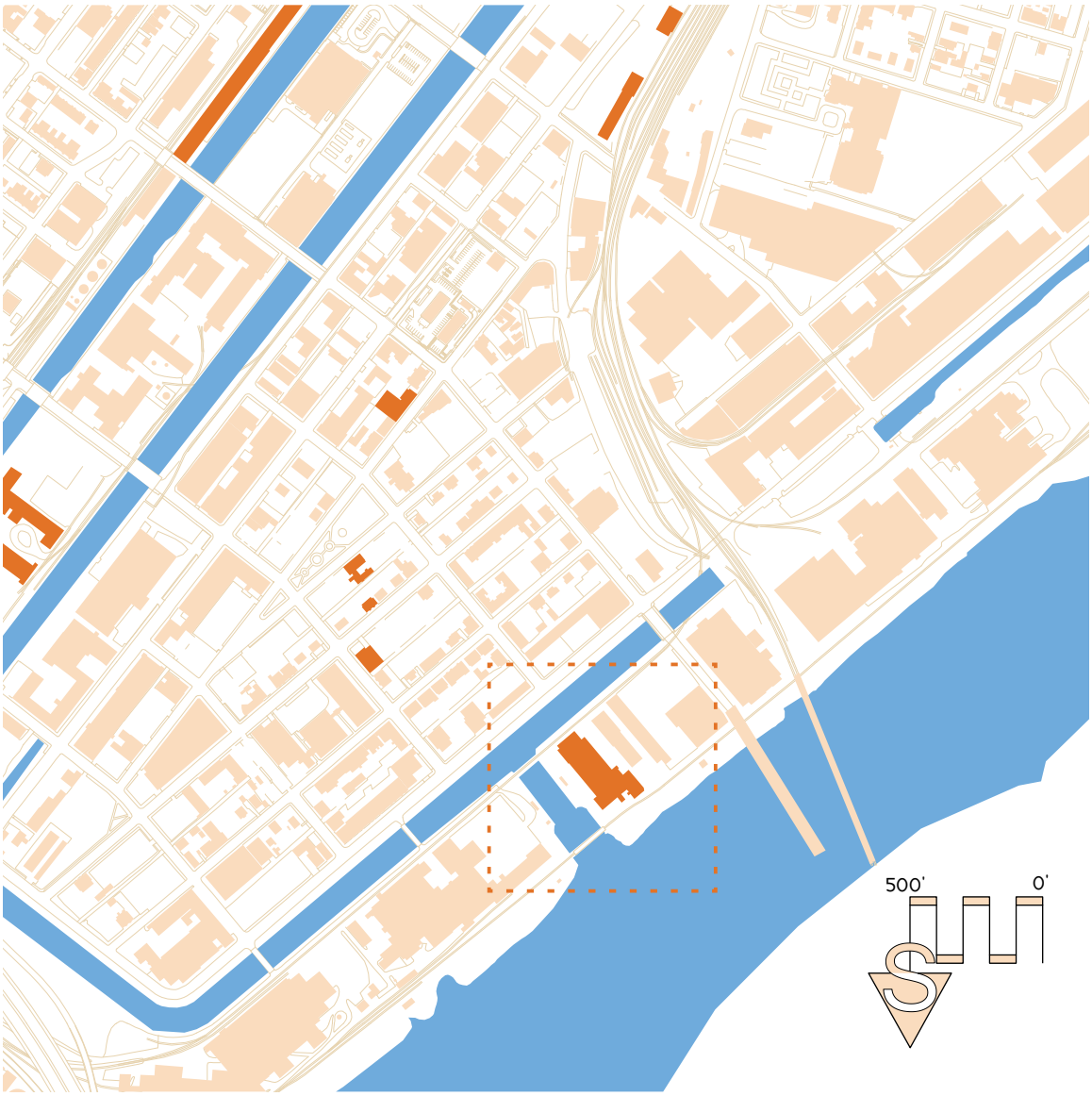


FIGURE 6.9: South Holyoke

Puerto Rican Holyoke

Holyoke was built by the Industrial Revolution, but the community of Holyoke today is defined by another industrialization process. Operation Bootstrap was begun in 1947 by the United States Government to convert the agrarian economy into a factory-based

3 Cecil Group, 2008.

manufacturing economy. The industrialization left forty percent of Puerto Rico's work force unemployed and increased the island's dependency on the United States.[4]

Traditional economic planning and development that promotes corporate growth and relies on capitalist principals to spread wealth exclude communities of color, poverty, and or cultural and ethnic heritage that doesn't align with the powerful economic socio-political structures of our society. The Puerto Rican community in Holyoke cannot be served exclusively through traditional economic development strategies.

In his June 15, 2002 lecture at the Planners Network National Conference entitled "New Visions for Historic Cities: Bridging Divides, Building Futures," Agustin Lao-Montes re-frames the globalization paradigm by coining the term "globalization from below." This paradigm relies on community-centered organizations working towards common goals around the world. Globalization does not – cannot – be exclusively available to multi-national corporations. Globalization happens when we expand our resources and learn to import and export ideas, social capital, and empathy across borders and oceans. Holyoke can learn from Mexico City, which can learn from Berlin and Nairobi.

Lao-Montes outlines a vision for what every community deserves. His goal is for every community to have the power, vision, and resources to achieve "good jobs; decent housing; quality education and health care; venues to develop cultural traditions; and creativity and education-making influence at all levels of government. These goals begin to articulate a baseline list of common rights for everyone; a standard to which we can evaluate success. Bhutan's Gross National Happiness Index is another baseline that broadens and deepens the evaluation of communities.

With the election of Mayor Alex Morse, who is not Puerto Rican, Holyoke has begun to build significant representation of the Puerto Rican community within the city government. Morse appointed Marcos Marrero, a Puerto Rican, as the director of economic development.

4 Lao-Montes, 2002.

The problem of how to engage undeserved communities is a problem of both organization and design. How can we gather people together and what are the structures – physical and political – that build commitment to the common good and empathy towards the interdependent web? The irony is that the Puerto Rican community in Holyoke, while on the one hand characterized by deep unemployment, drug addiction, school dropout/truancy, crime, poverty, and discrimination, is on the other hand, a source of cultural richness, a model of urban agriculture, and has access to a wealth of valuable (though unused) physical resources in the historic building stock, canal system, and the Connecticut River.

The goal of this thesis is to provide culture and power to everyone. Even, and perhaps especially, those who are living on the margins of society.

Sustainable Design

Another aspect of the context in which this thesis is presented is the discourse surrounding sustainable design. The specific design proposal does not focus on sustainable building science. Rather, it assumes as a given the theories of regenerative design including:

- "operational integration with natural processes, and by extension with social processes;
- minimum use of fossil fuels and [human]made chemicals except for backup applications
- minimum use of nonrenewable resources except where future reuse or recycling is possible and likely;
- use of renewable resources within their capacities for renewal;
- composition and volume of wastes within the capacity of the environment to reassimilate them without damage."[5] (Lyle, p.11)

5 Lyle, 1994.

Regenerative Design is a direct response to the linear flows of resources developed during the Industrial Revolution. In contrast to nature, which has evolved in complex networks adapted to local environments, human design has developed simple forms repeated across (and within) the surface of the earth without regard to the varied conditions being impacted. Eugene Odum wrote in 1993, "current cities are parasites that, unlike successful parasites in nature, have not evolved mutual aid relationships with their life-support host landscape that prevent the parasite from killing off its host and thereby itself."

John Tillman Lyle provides a concise recipe for applying regenerative strategies in his case study of the Center for Regenerative Studies:

- "Let nature do the work
- Nature as model and context
- Aggregating, not isolating functions
- Optimum levels for multiple functions
- Matching technology and need
- Using information to replace power
- Multiple pathways
- Common solutions to disparate problems
- Storage as a key to sustainability
- Form to facilitate flow
- Form to manifest process
- Prioritize for sustainability" (Lyle, pp. 46-48)

In a sermon given at the Cathedral of St. John the Divine, William McDonough articulated

the connection between ethics and design. He writes, "If we understand that design leads to the manifestation of human intention and if what we make with our hands is to be sacred and honor the earth that gives us life, then the things we make must not only rise from the ground but return to it, soil to soil, water to water, so everything that is received from the earth can be freely given back without causing harm to any living system. This is ecology. This is good design."[6] (McDonough, p. 182)

This summary of McDonough's philosophy now known as Cradle to Cradle was a profound concept when introduced in the early 1990's. But the crux of the sermon appears later in the form of an anecdote about the designing of a daycare center in Frankfurt. The design team was discussing the operable windows. "The engineers asked, 'What happens if the children forget to close the shade and they get too hot?' We told them the children would open a window. 'What if they don't open a window?', the engineers wanted to know. And we told them that in that case the children would probably close the shade. And they wanted to know what would happen if the children didn't close the shade. And finally we told them the children would open windows and close shades when they were hot because children are not dead but alive."[7] (McDonough, p. 186)

The occupants of buildings and streets and cities and farms are alive. The occupants are not merely occupants, but operators, and participants in the ecology of buildings and streets and cities and farms. How these spaces are designed determines how humans interact with the larger systems that support life.

6 McDonough, 1993.
7 Ibid

DESIGN PROPOSAL

With the support of the thesis committee, I chose a site and applied the strategies developed in the previous section as an experiment in building empathic consciousness towards our biosphere.

Figure IV.1: Physical Model

CHAPTER 7:

THE LOOP

By examining the larger context and placing the site within the city, a gestalt understanding of the whole emerges. Addressing the connections between 160 Middle Water St and the city center neighborhoods in Holyoke places the site on a loop of experiences designed to integrate daily life with natural systems. Twelve interconnected nodes are located where existing natural systems would be enhanced. The Loop is located at the edges so that citizens can inhabit liminal thresholds at the margins of the city (Figure 7.1).

FIGURE 7.1: Loop of Interconnected Nodes

Joan Nassauer writes, "We should design landscapes and policies to intenionally use the appearance of the landscape to help people recognize ecological health. One way to do this is to design landscapes that protect or reveal ecological function."[1] (Nassauer, p. 78)

The twelve nodes build empathic consciousness by embedding daily life within the natural systems that support life. They are connected by a mixed-use path suitable for pedestrians and cyclists to move through and within the edges of the city.

1) Trains & Bikes & Birds in a Meadow: The Loop runs along side the freight and commuter train line through a meadow planted as part of the wild bird sanctuary that runs through the Connecticut River valley (Figure 7.2).

FIGURE 7.2: Meadow

2) Hydrology of the Canals: As the Loop crosses the canals, a built intervention allows small groups of people to descend to the waters edge to interact directly with the water by testing water quality and monitoring fish and amphibious life (Figure 7.3).

FIGURE 7.3: Heron in Canal

1 Nassauer, 1997.

3) Tracking Fish Migration through the Hadley Falls Fish Lift: Connecting to the existing Hadley Falls Fish Lift is an important move and takes advantage of the historic intervention. The annual shad migration is culturally and economically important and has been for generations. Holyoke Community College students take shifts counting the fish as they fight their way upstream.

4) River's Edge Flora and Fauna: Interacting with the river's edge provides a stark counterpoint to the canals. The unique ecosystem of shoreline plants and animals is best experienced barefoot.

FIGURE 7.4: River's Edge

5) Field and Forest Island: Surrounded by a busy highway, Route 202, the Field and Forest island provides the opportunity to engage with fruit and nut trees grown alongside mushrooms and other shade-loving foods.

6) Complete Streets: The Loop presents Beech Street as a prototype complete street for the city of Holyoke that includes bioswales, bike paths, sidewalks, narrow traffic lanes, and productive front-yard gardens.

7) Pocket Park: A small vacant lot is utilized as a community garden space for gathering and sharing of knowledge and experience growing food.

8) Wildflower an Fruit-Tree Grove with Apiary: The crucial role pollinators play throughout the ecosystem is experienced in an apiary adjacent to Holyoke High School. Wildflowers and fruit trees provide pollen for bees close to the hives, an important component to combating colony collapse disorder.

9) Hillside Forest: The forest behind the High School is cultivated as habitat for birds and small mammals while also serving as gathering space for small groups of teenagers seeking a safe place to experiment with unsupervised activities.

10) Wetland Ecology: The Loop includes a stop at a built wetland - one of the most precious and ever-changing ecosystems.

11) Wastewater treatment & underpass garden: The Loop passes underneath Interstate-391 and in this warren of concrete, human kind's mark on the landscape is felt in the bones as passing cars and trucks vibrate through the body. Exposure to the wastewater treatment facility provides a reminder of the role sewer systems play and the closed loop hydrology of the planet.

12) 160 Middle Water Street: The canal system finally meets the river at 160 Middle Water Street and this Node serves to connect dancers to the earth, river and sky.

CHAPTER 8:

SITE

Conditions

160 Middle Water Street sits between the Third Level Canal and the Connecticut River (Figure 8.1). Their is a 25' elevation change from the existing building pad to the river. The site is relatively flat with an elevation of 70'; the river bank slopes steeply toward the River.

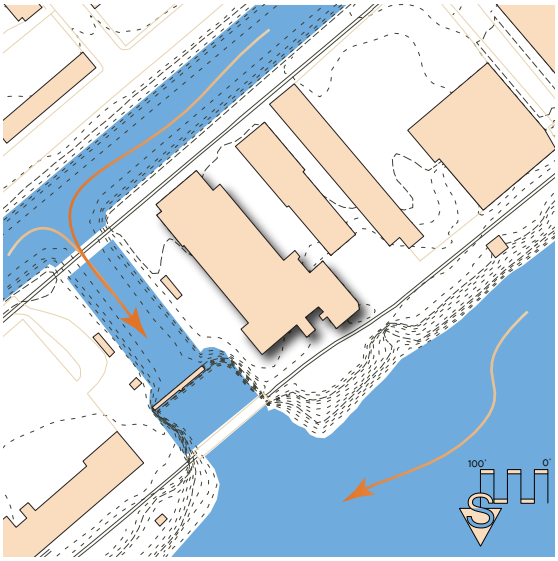


FIGURE 8.1: 160 Middle Water Street - Hydrology

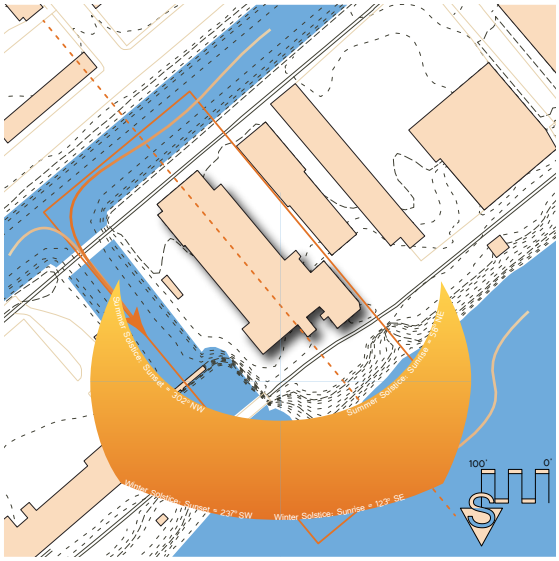


FIGURE 8.2: 160 Middle Water Street - Sun Patterns

The primary axis of the site runs from northwest to southeast. This provides the opportunity to face the rising sun on the winter solstice (Figure 8.2). 160 Middle Water Street is at the end of a dead-end street (Figure 8.3). Two parallel railroad spurs run along the River and Canal.

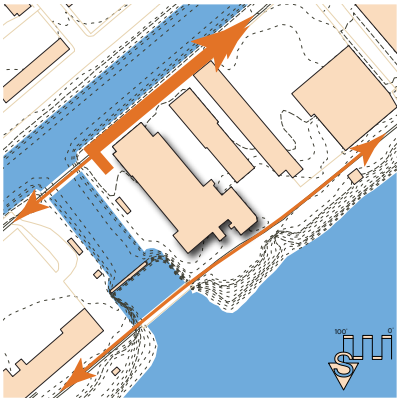


FIGURE 8.3: 160 Middle Water Street - Transportation

A section through the site reveals separation between the residential neighborhood in South Holyoke and the Connecticut River (Figure 8.4).

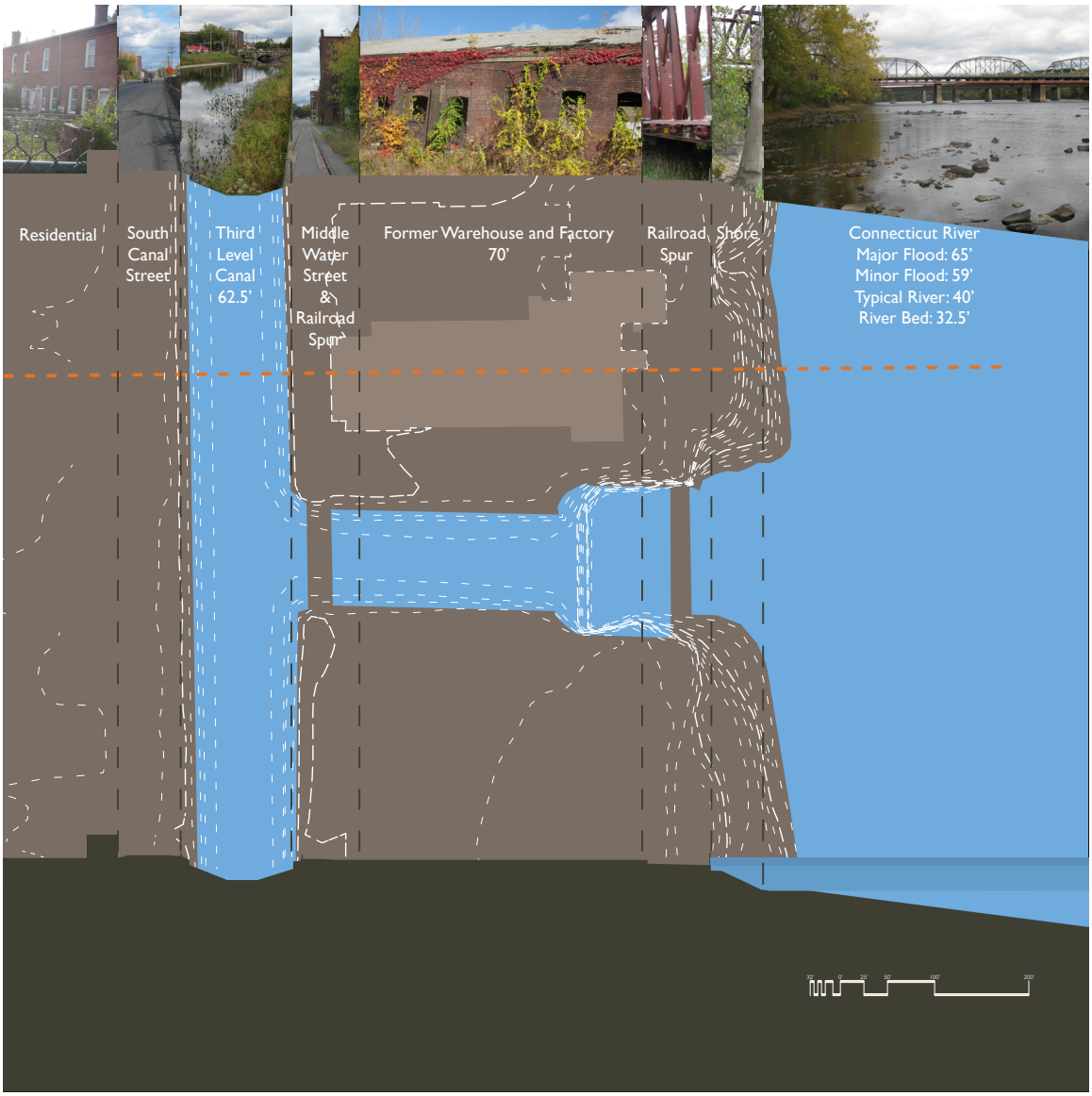


FIGURE 8.4: Existing Site Section

160 Middle Water Street is within the FEMA 500-Year floodplain, but above the 100-Year floodplain (Figure 8.5).

Figure 8.5: FEMA Flood Delineation

The Holyoke Office of Planning and Economic Development published a comprehensive urban renewal plan in 2012 titled, "Connect, Create, Construct." This outlines a strategy to revitalize the heart of Holyoke through targeted redevelopment and creative envisioning. Part of the plan identifies city-owned property that should be demolished for redevelopment. The plan includes one-page summaries of these properties that provides a brief overview of the current value of the asset and reasons for demolition. 160 Middle Water Street is described as

a likely contaminated site in very poor condition (Figure 8.6).

160 Middle Water Street

047-01-011

Area #10 – 2nd and 3rd Level Canal

Ward:	2
Zoning:	IG
Acres:	1.40
Bldg Type:	Warehouse – 2 stories
Condition:	Very Poor
Bldg Size:	66,941 GSF
Owner:	City of Holyoke
Address:	City Hall Annex – Law Dept. Holyoke, MA 01040
Total Value:	$40,300
Land:	$39,100
Bldg:	$1,200
Vacant?	Yes
Tax Title?	No
Action:	Transfer

Description:
This vacant industrial building is currently City owned and is in very poor condition with possible contamination issues. Getting this site cleaned up and "site-ready" will make it highly marketable. It is located within an industrial area of the City, making reuse of the land for manufacturing a likely option. Industrial reuse also creates the potential for numerous job opportunities and additional tax revenue to the City.

FIGURE 8.6: Redevelopment Summary

History

In 1866, the Franklin Paper Company was founded. The paper factory at 160 Middle Water Street appears in an 1881 drawing of Holyoke (Figure 8.9), an 1876 engraving(Figure 8.7), and an 1880 canal planning map (Figure 8.8).

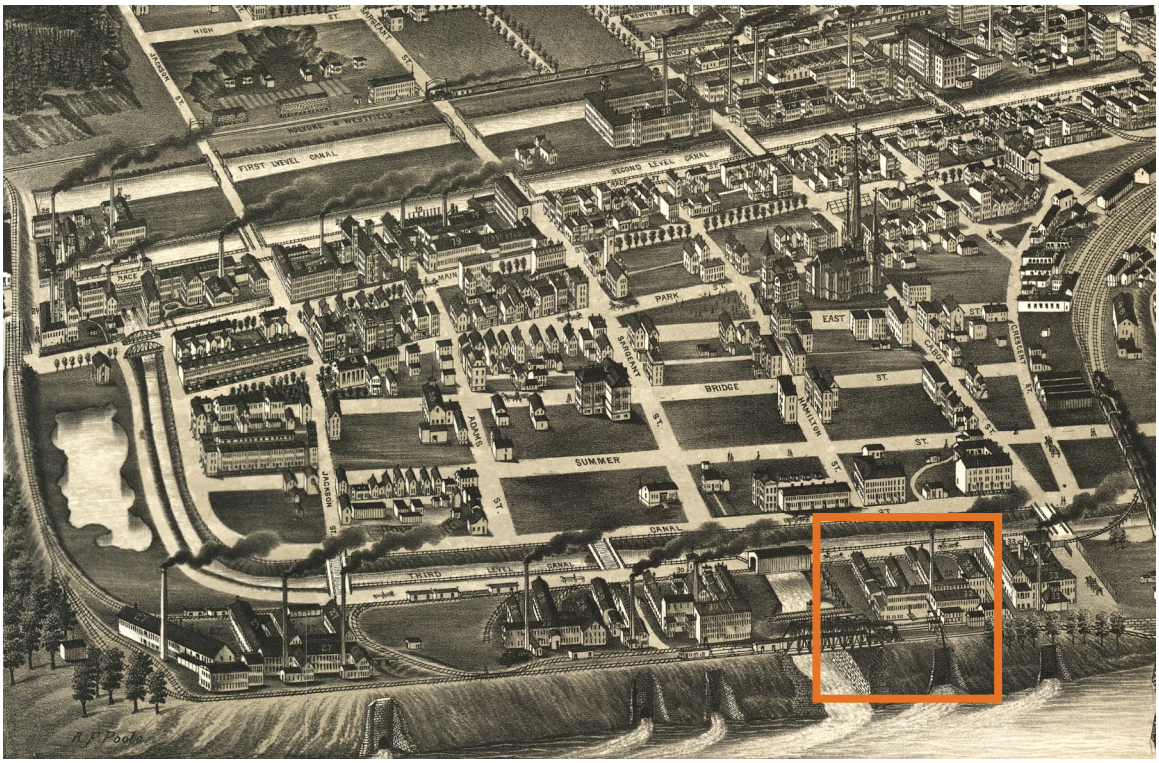


FIGURE 8.9: 1881 Birdseye Drawing

FIGURE 8.7: 1876 Engraving

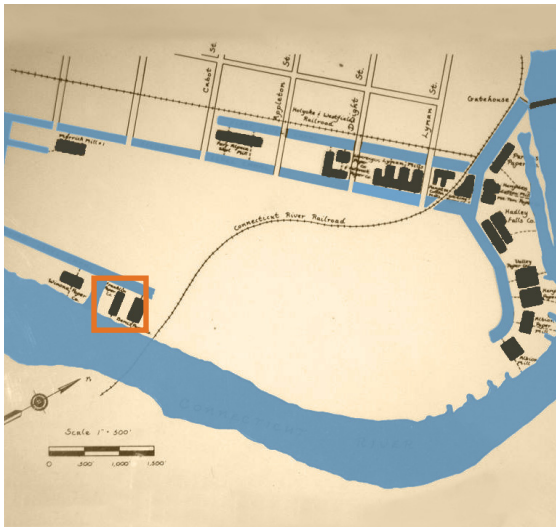


FIGURE 8.8: Canal Planning Map, 1880

The Franklin Paper Company was sold to the Wauregan Paper Company (Figure 8.10). Sometime in the middle of the 20th century, the mill was abandoned and converted into a warehouse, which was then also abandoned. It has been vacant for at least twenty years and though the ruins of the original mill buildings can be seen, the site is mostly a burnt out carcass.

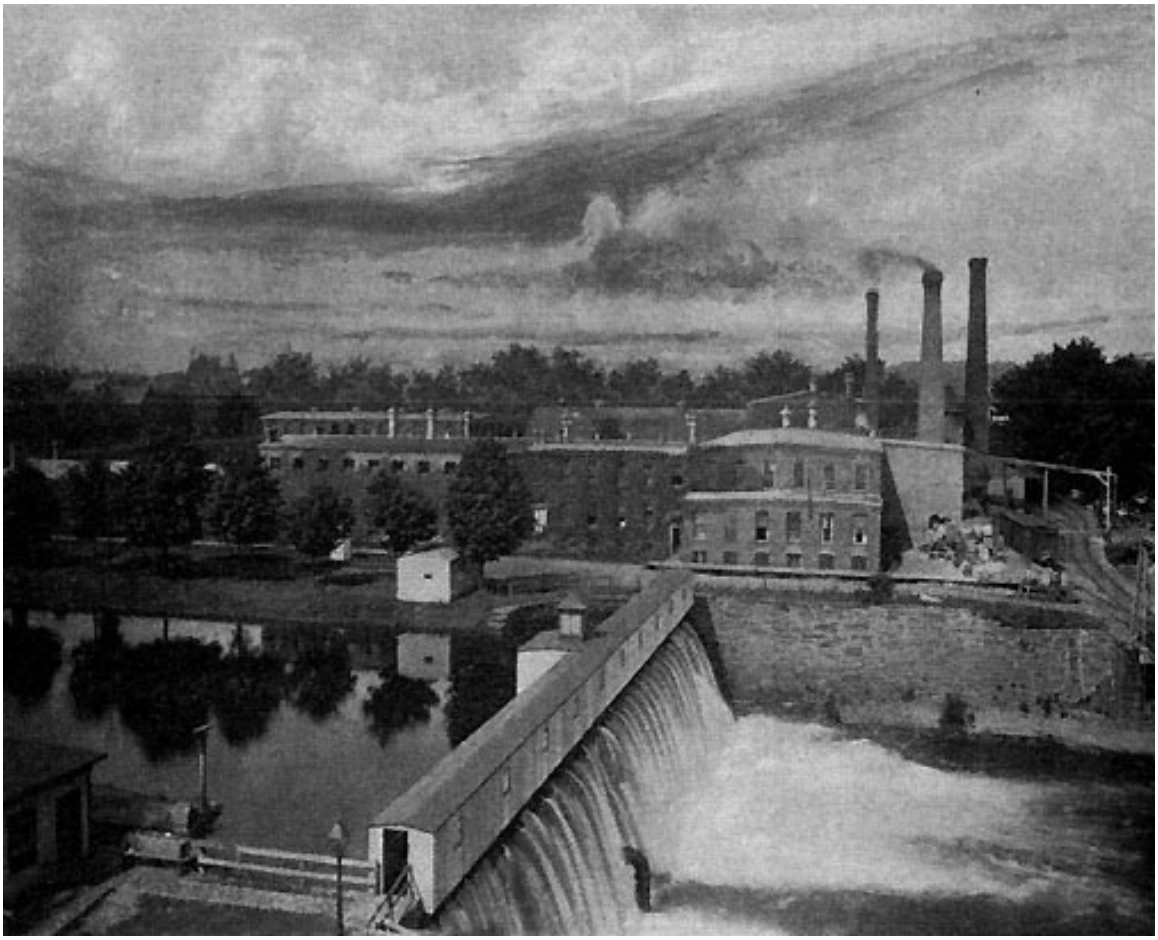


FIGURE 8.10: Wauregan Paper Company

Majesty

160 Middle Water Street is within the margins of Holyoke. It lies at the edge of the city at the end of a peninsula of land on the way to nowhere. This piece of land feels forgotten, and yet special. It's relationship to the calm waters of the canal, the violence of the waterfall, and the rhythmic flow of the river provide a dynamic envelopment of the senses. The remains of the Industrial Revolution are constant reminders of the consciousness that build Holyoke and is

no longer applicable. The feral plants are reminders of nature's unrelenting beauty.

The water level in the canals is controlled by the Holyoke Gas and Power Company. When empty, the canals are a mud flat archive of the city's discarded junk (Figure 8.11). But when full, the placid water serves as a reflection pool (Figure 8.12).

FIGURE 8.11: Drained Canal

FIGURE 8.12: Reflective Canal

The site is about half abandoned building and half flat site. Two large sugar maples remain from what used to be a line of 8 trees (Figure 8.13). Everywhere, plants are overtaking the structure and highlighting the speed with which human intervention can be shrouded by organic growth (Figure 8.14).

FIGURE 8.13: Two Maples

FIGURE 8.14: Ivy on Building

The threshold between canal and river is a magnificent 20' waterfall that dominates the aural experience throughout the site and it's power is hypnotizing. It is within this threshold that the realtionship between human intervatention and natural processes is perhaps most

viscerally experienced. As the waters join after being separated above the Hadley Falls Dam, the manufactured and the natural are once again reunited (Figure 8.15 - Figure 8.17).

FIGURE 8.15: The Waterfall

FIGURE 8.16: Liminal Space Between Waterfall and River

FIGURE 8.17: Train Bridge, Waterfall in Background

160 Middle Water Street is separated from the Connecticut River by a floodwall and freight train spur (Figure 8.18). A small clearing on the far side of the flood wall is the only space that resembles a lawn suitable for group gathering (Figure 8.19).

FIGURE 8.18: Flood Wall and Train Spur

FIGURE 8.19: Lawn

Access to the river is provided by a rough trail that emerges at a sandy beach (Figure 8.20). Evidence of fishing can be founded along the shoreline.

FIGURE 8.20: Sandy Beach

Throughout the site, the conflict of nature and building is illustrated when bricks and plants collide (Figure 8.21 & Figure 8.22).

FIGURE 8.21: Ivy on Brick Wall

FIGURE 8.22: Groundcover on Fallen Bricks

Inside, the remains of the factory and warehouse have been burnt and have collapsed. The result is a luminous space defined by the elements. It smells like burnt wood and soggy leaves, and yet, when the light slices through the windows, it's easy to imagine the space as sacred (Figure 8.23).

FIGURE 8.23: Sacred Light

Below ground, remains of the coal-powered system (Figure 8.24) and the hydropower infrastructure are still visible (Figure 8.25).

FIGURE 8.24: Base of Smokestack

FIGURE 8.25: Turbine Foundation

CHAPTER 9:

PROGRAM

Agora for All

Cities in ancient Greece, the birthplace of democracy, featured a central public square devoted to gathering, politics, and commerce. This model of open access to public space has persisted and continues to be a central tenet of urban planning. However, much like the Agora in ancient Greece, public spaces today continue to be successful as metaphors for public participation without inviting everyone into the process. Like the Greek politicians, who were wealthy, land-owning men, the 'public' today excludes the poor, undereducated or unemployed, homeless, and destitute from participation in the democratic process.[1]

Architects can be – should be – builders of democracy. By designing space that are transparent and accessible to everyone is, at the very least, a powerful metaphor for democratic political structures. Taken one step further, spaces can be designed that allow for the deliberative process central to an open political sphere. Central to the success of public space is the clarifying of "public" and the acknowledgment that no Agora – no public space – is accessible to all people. There are multiple publics and developing agoras for these separate and sometimes overlapping publics can promote engaged discourse for all.

While the librarian, fireman, bus driver, mayor, banker, and mother may find themselves together in a city park with the homeless, unemployed, and illiterate, they are not, necessarily, participating in a shared public experience. The public is and should be diverse and strengthened by a wide range of individuals, but as Chantal Mouffe proposes, the goal is not an inclusive rational consensus. It is, rather, an adversarial dynamic in which various publics are in opposition to each other and allowed to result in a messy amalgam of public spaces illustrative of the messy democratic process.[2]

1 Aeschbacher, 2008.
2 Ibid.

Leaving Space in the Margins

Architecture is not a salve for all that ails society. A good building does not neccesarily fix poverty or drug addiction or truancy or crime. "To promote, say, balcony access over chronic unemployment as the cause for social unrest is symptomatic of a determinist approach to architecture in which the built form is argued to have a direct causal effect on social behavior."[3]

However, a good building (or park or street or plaza or space) can provide a space for social and political restructuring. Our built environment is both a result and a cause of the social structures that govern our community and by designing frameworks for empowerment, inclusion, and engagement, the architect can facilitate change. However, it is imperative that the architecture does not distract from the larger injustices that may need to be addressed through policy, cultural interventions, and direct action. Focusing too much on the architecture can create a political amnesia of the conditions that caused society's struggles.

Reading Inside the Margins

Numerous practitioners have successfully implemented designs and strategies that directly address life in the margins. Specifically, these architects have developed spaces for the poor to dwell alongside the rich; for the educated to cohabitate with the illiterate; for the immigrants to belong in shared spaces with the native.

David Baker is an architect in San Francisco whose portfolio includes numerous successful projects that integrate affordable housing with market-rate units and mixed-use commercial spaces. His focus on sustainable affordable housing has led to numerous awards and publications including the Hearthstoen Builder Humanitarian Award. Baker's response to the elimination of redevelopment agencies in California is Inclusionary Zoning. As funding sources for affordable and subsidized housing disappear, Baker has found another way of

3 Till, 1998.

making affordable housing an economically viable development strategy. Inclusionary Zoning requires developers building market-rate (or luxury) housing to include a portion of the units for sale or rental to low-income residents. This model replaces the state-funded redevelopment agencies with middle and upper-class homeowners as the source of subsidies for affordable housing.[4]

But Inclusionary Zoning does not provide nearly enough affordable housing units. Demand is rising and in order to maintain economic diversity in our cities, additional housing options for low-income residents needs to be provided. Affordable housing projects can rely on as many as eleven funding sources, a number that can prove too cumbersome and can prevent a project from being completed.

The Detroit Collaborative Design Center, on the other hand, took a different approach to community development. The Woodbridge Neighborhood Development Strategy is the result of a partnership between the Detroit Collaborative Design Center and the Woodbridge Neighborhood Development Corporation and a six-month deep engagement process. The product is a dynamic publication that illustrates a range of design strategies for community development. Public gathering spaces have been located next to business incubators; eco-villages present a new model for residential development that marries economic, social/cultural, and environmental foci; old storefronts are repurposed for small business; affordable housing prototypes incorporate garden spaces and front porches.[5]

In Hudson 2+4, Teddy Cruz and the Parc Foundation merged a linear garden, market-rate and affordable housing, with an intergenerational center on a relatively small in-fill lot in Hudson, New York. On another, slightly larger parcel, commercial uses including a co-op grocery, movie theater, and childcare located adjacent to market and affordable-rate housing which, when combined with student housing creates an inner courtyard for a garden, playground, and childcare facilities. On a third site, municipal functions including a courthouse, police station,

4 Baker, 2011.
5 Woodbridge, 2008.

and community porch converge with a swimming pool, public garden, and community and affordable housing. The fourth site introduces a typology that mixes art and cultural space with a restaurant and mixed-income housing. Yet another design combines social services like a clinic with mixed housing. Throughout all of these proposals, Teddy Cruz is envisioning a new model for housing that places the residential experience adjacent, and reliant on, the commercial, social, and political life of a community.[6]

In Casa Familiar/San Ysidro, Teddy Cruz expands the preview of the architect to include the design of a political process. The architect, in partnership with a local non-profit, begins by mapping non-conforming uses of space. Throughout the neighborhood, residents have created architecture without architects, designing for themselves, the spaces to satisfy their needs. Once these non-sanctioned uses have been mapped, the architect develops a zoning strategy that allows, and even promotes, these new-uses. In partnership with city officials, permits and financing structures are now possible to allow growth within these sectors. In this way, the community is empowered to make their own zoning decisions based on in-place testing of ideas over time.[7]

While these precedents focus on housing, they serve as examples of architecture that aims to shift culture by shaping the way communities are structured and the ways people interact. It is within that vein that 160 Middle Water Street aims to shift human consciousness while providing a space for dancing.

Program Conditions

Consciousness is shaped by communal gatherings of various sizes; embodied awareness of the individual self; earthly connection to the elements; ritual and tradition; phenomenological majesty that defies explanation; temporal significance; solitary meditation; information dissemination; and creative expression. These conditions combine to create the program for

6 Ouroussoff, 2008.
7 Cruz, 2010.

160 Middle Water Street.

The specific space requirements for these conditions are listed below:

Transition into sacred space (taking shoes off, coat room, bathrooms);

Transforming raw goods into manna (kitchen, costume/set shop, sound/light booth)

Communal Fellowship (dance/yoga/zumba class, jam, rehearsal)

Shared experience of witness (audience, ceremony, ritual)

Expression and Artistic Exploration (dance performance, preaching, rehearsal)

Meditation (solo sunrises, shared decent into the earth, baptisms)

Ecologic Experience (flora, fauna, hydrology, solar, lunar, celestial, stratospheric)

Gatherings at many scales (picnics for a few, rituals for a dozen, celebrations for hundreds)

Confronting the edge (tracking flooding, walking in mud, witnessing erosion)

Three Journeys Illustrate Program

Juan is a high school student at Dean Academy who I met in October when he was fishing in the Canal. He uses 160 Middle Water primarily as an access point to the River. He ascends through the allée, across the deck and towards the Overlook before descending down the stairs and trail to the river's edge where he can be alone and in direct contact with the enormity of the Connecticut River.

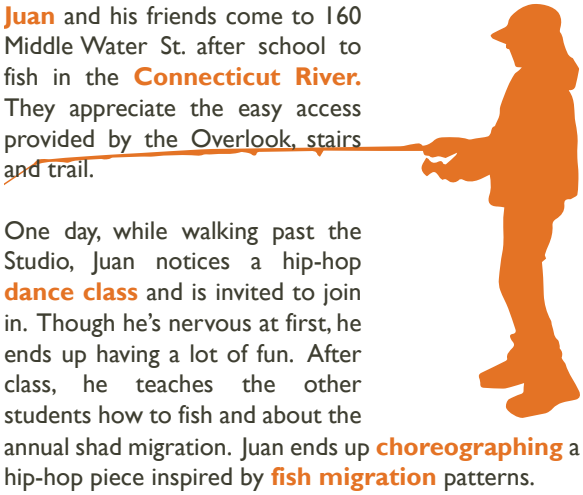


FIGURE 9.1: Program Narrative - Juan

FIGURE 9.2: Juan Heads Toward the River

Saliq is a contemporary choreographer who currently rehearses and performs at Tree Studio on Cabot St. He uses the Studio at 160 Middle Water because of the way the evening sun slices through the tree canopy, curtain wall, and sun shading system to create dramatic environments for his dance.

Wire Monkey Dance, a contemporary dance troupe led by **Saliq** has performed and rehearsed at Tree Studio in the Paper City Brewery building on Cabot street for years. Saliq is choreographing a piece to capture the subtle change in **light** as the sun sets. He's using the Studio at 160 Middle Water because of the natural light and flexible space. The **reflecting pool** slows down the audiences pace as they arive and marks the beginning of a sacred place – a space for communal experience of the divine.

FIGURE 9.3: Program Narrative - Saliq

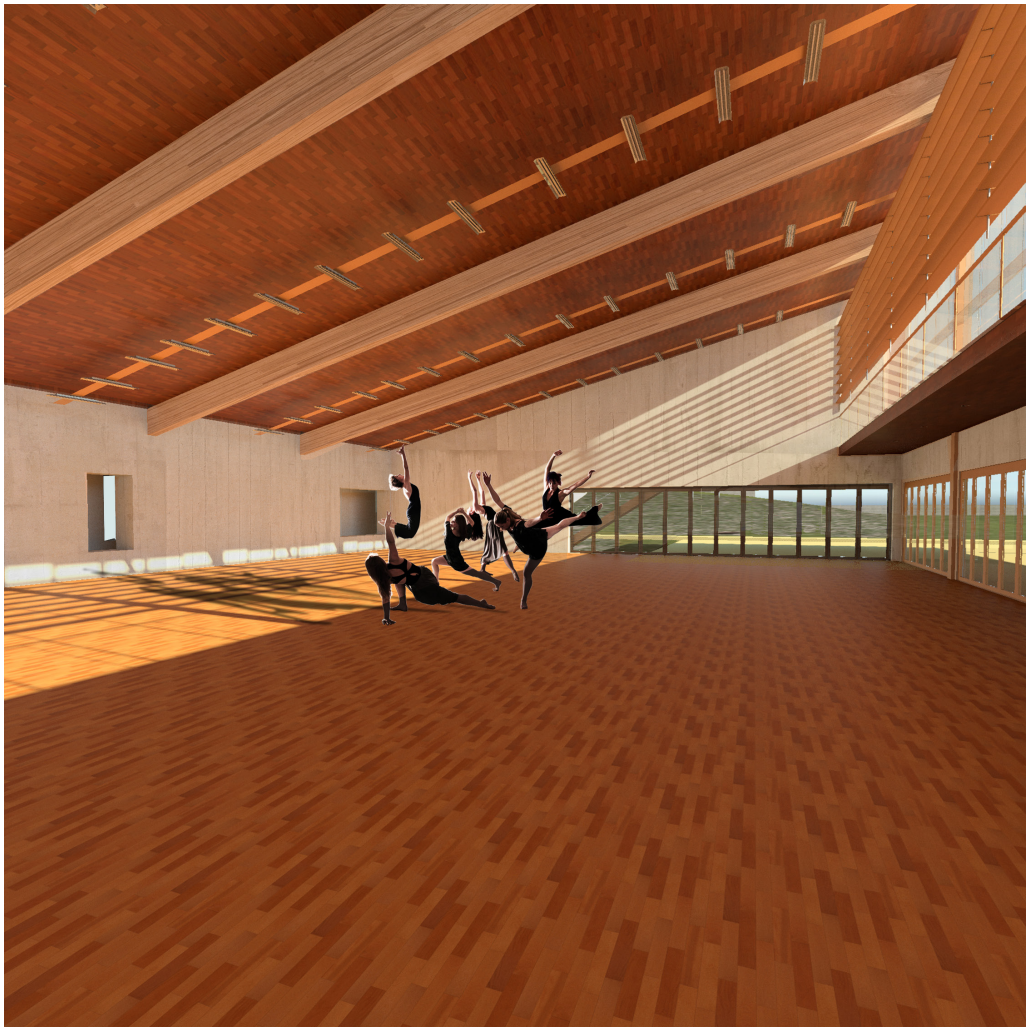


FIGURE 9.4: Dancers Rehearse in the Sunlight

Kate started Paper City Fitness and uses Zumba to build community, health, and commitment to a better Holyoke. A 7:00 AM Zumba class in March is interrupted when the rising sun slices through three aligned windows in the wall and marks the equinox. Kate pauses the class and takes everyone to the deck where they can experience the moment together.

On a morning in mid-March, **Kate** arrives early for her 7:00 AM Zumba class. She enters through the Wall and turns on the lights – the daylight savings has just ended and the sun won't rise until after her class begins. Her morning class is small, so she doesn't open up the Lobby. Instead, people come in through the Wall and take off their shoes and change into their dance clothes in the dressing rooms. Upon entering the Studio, they are delighted by the striking slice of light because the **sun** is aligned with the windows and penetrates deep into the Studio marking the **equinox**.

FIGURE 9.5: Program Narrative - Kate

FIGURE 9.6: Morning Zumba Class

CHAPTER 10:

AXONOMETRIC DIAGRAMS

160 Middle Water is a design proposal that connects dancers to the earth, river, and sky.

Located between the Third Level Canal and the Connecticut River, 160 Middle Water rises from the industrial ruins of a factory and warehouse.

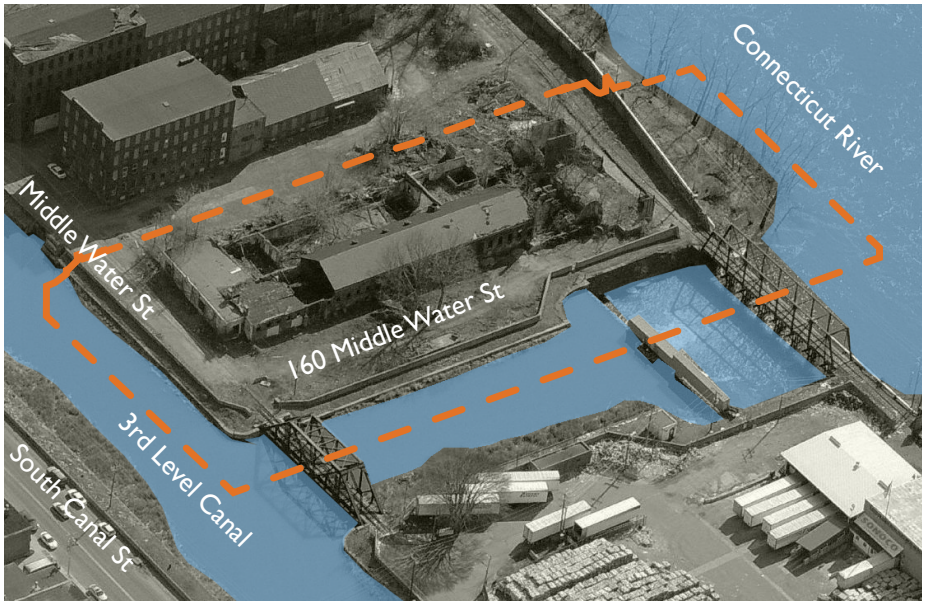


Figure 10.1: Aerial Photograph

The primary site organization is a transition from inside to out and from familiar to extraordinary.

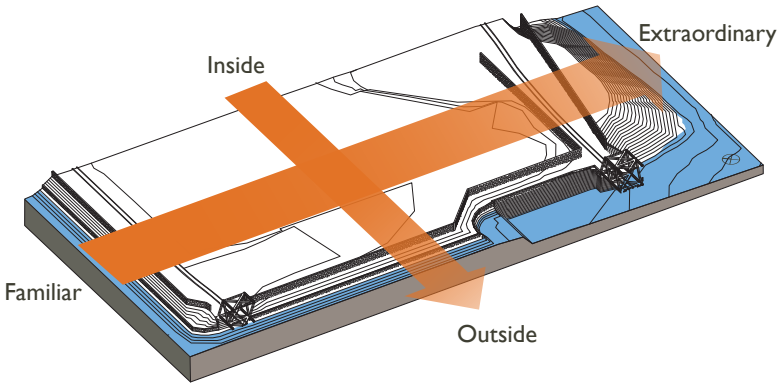


Figure 10.2: Parti Diagram

By lifting topography, a false horizon is created and a shift in prospective occurs halfway up the hill when Chicopee and the River come into view.

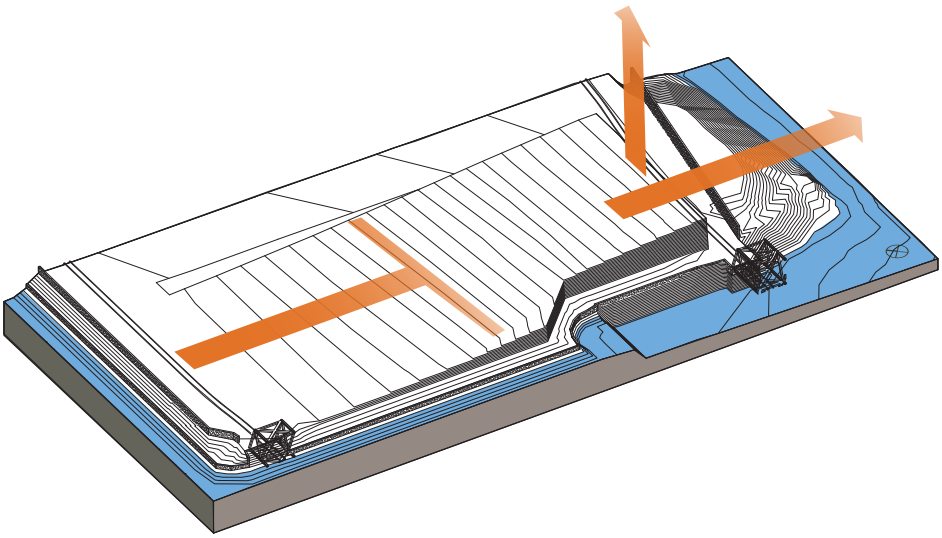


FIGURE 10.3: Shifting Horizons

Two primary paths lead from the canal to the river.

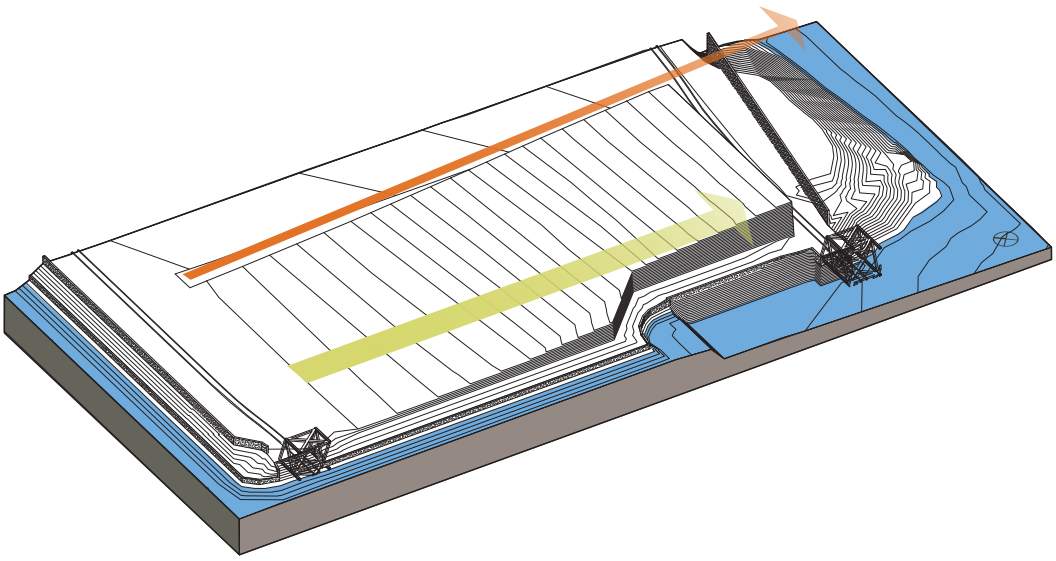


FIGURE 10.4: Parallel Paths

One inside path defined by a thick wall; the outside defined by an allée of sycamore trees.

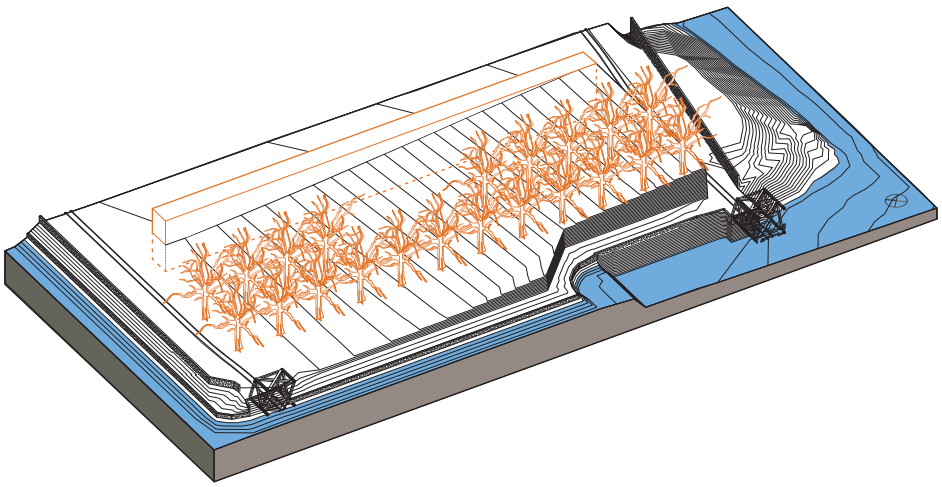


Figure 10.5: Inside Wall; Outside Alleé

The paths are interrupted with lateral distractions that pull across the spectrum from interior to exterior.

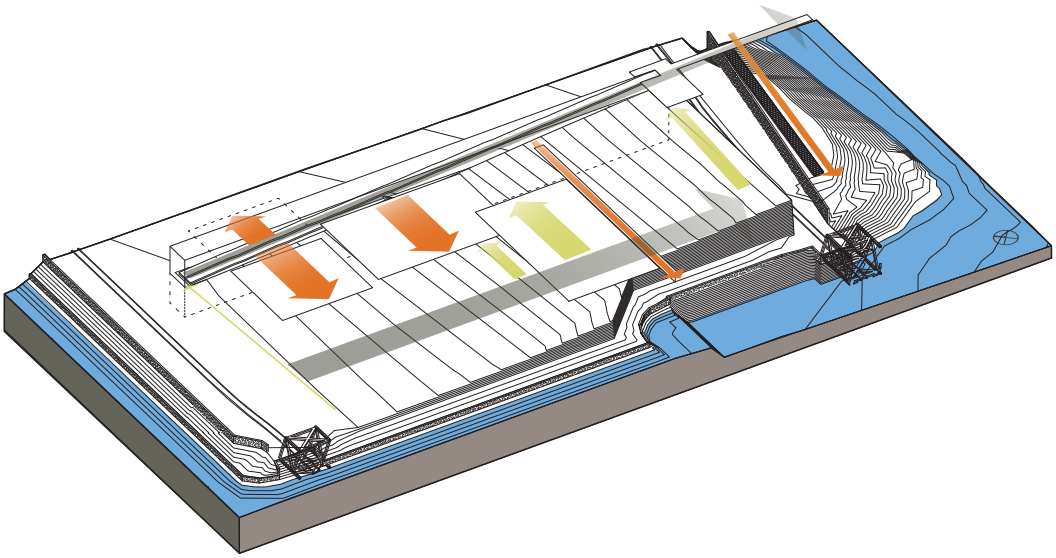


Figure 10.6: Interruptions and Distractions

Moments of transformation and revelation occur when expectations are shifted.

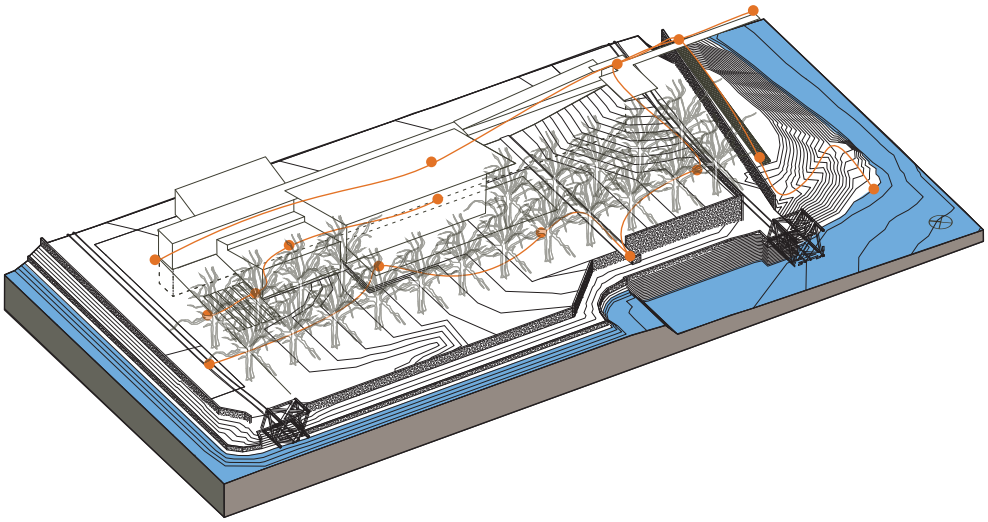


Figure 10.7: Expectations are Shifted at Moments of Revelation

Heat from the sun is captured and transferred to water before being distributed through a radiant floor.

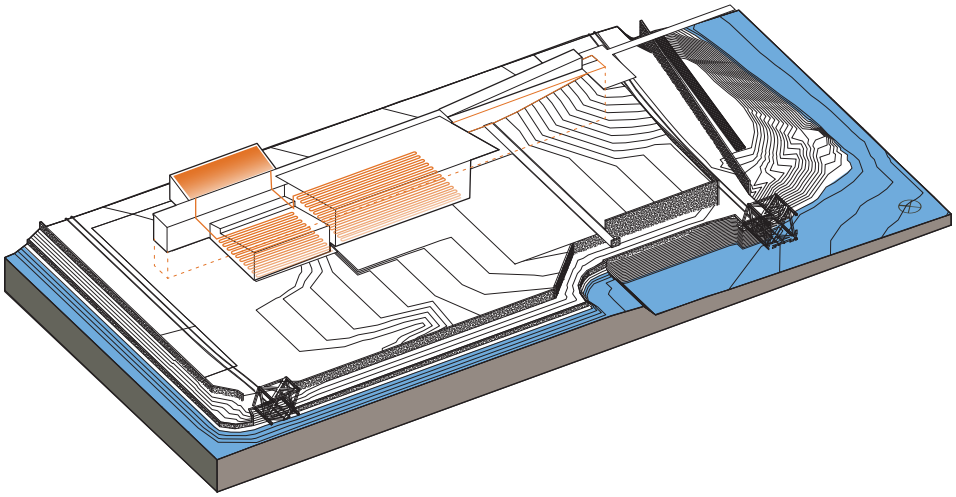


Figure 10.8: Heat Capture and Distribution

Stormwater is captured from the butterfly roofs, channeled into glass gutters, dropped along exposed rain chains, stored in the reflecting pool, transported through a French drain and infiltrated at a planted bioswale.

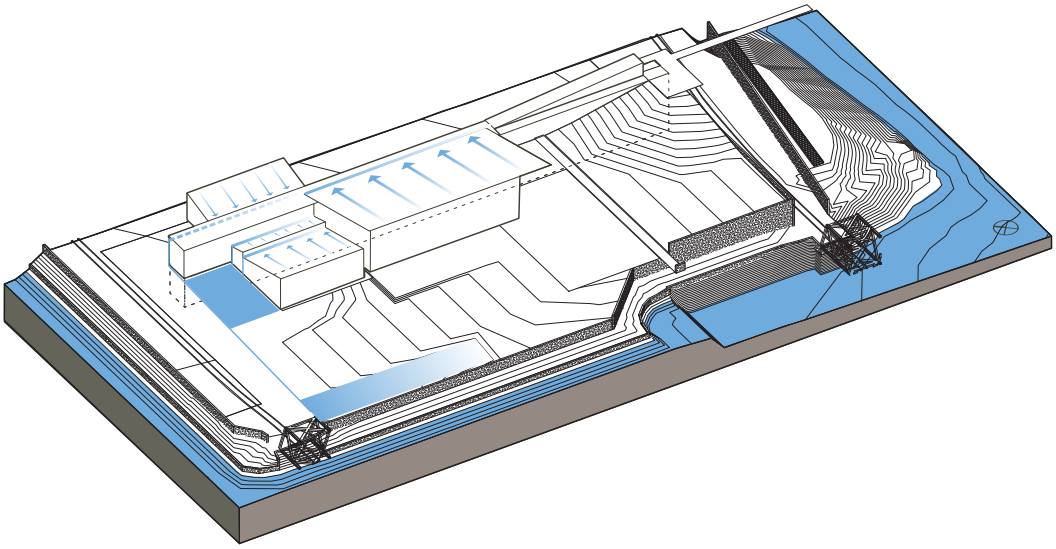


FIGURE 10.9: Stormwater Catchment

CHAPTER 11:

CONNECTIONS TO THE EARTH, RIVER, AND SKY.

Overlapping orthogonal planes of hardscape intersect as they step up the gently rising landform (Figure 11.1). The two axis appear as a parallel journeys from the canal to the river. The interior path is a long slender corridor that rises from the street to the river overlook. The exterior path is a gently sloping alleé of sycamore trees.

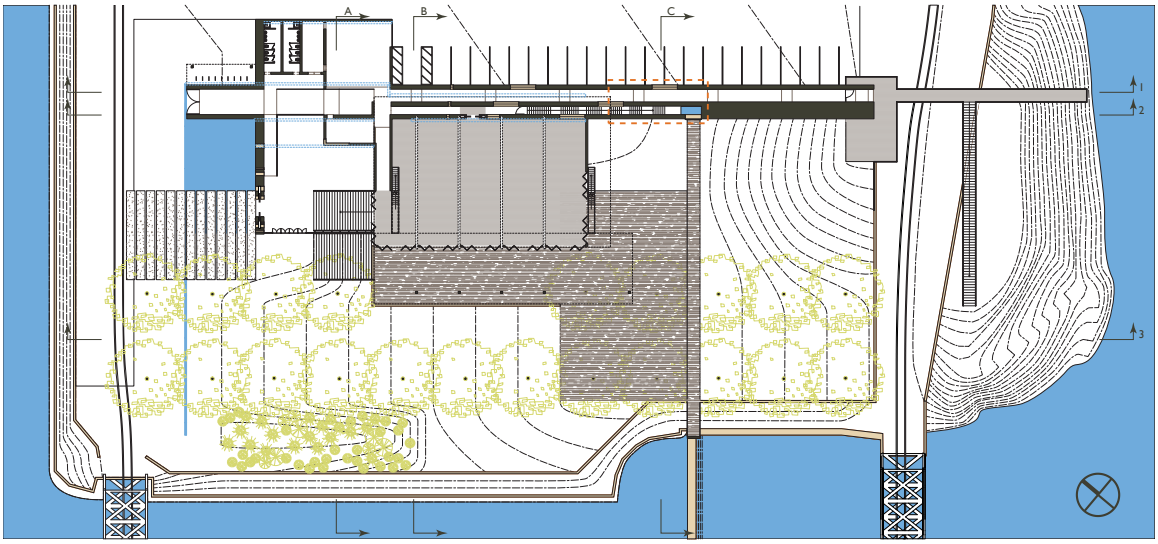


FIGURE 11.1: Plan of 160 Middle Water

Rises and drops in the ground plane (Figure 11.2) accompany lofted (Figure 11.3), compressed, and filtered ceilings to create a progression from the familiar to the extraordinary.

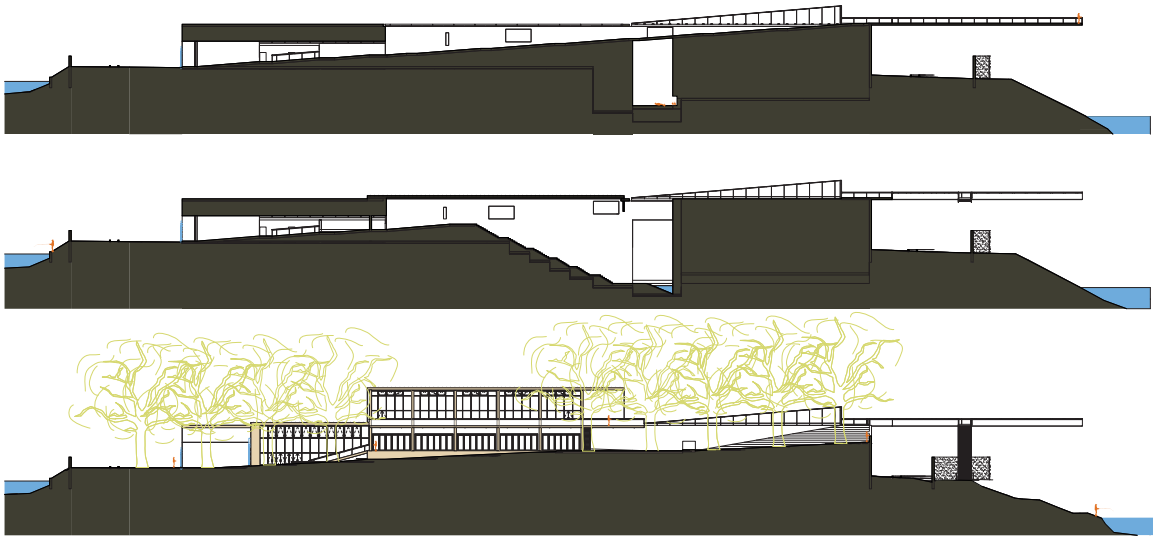


FIGURE 11.2: Longitudinal Sections

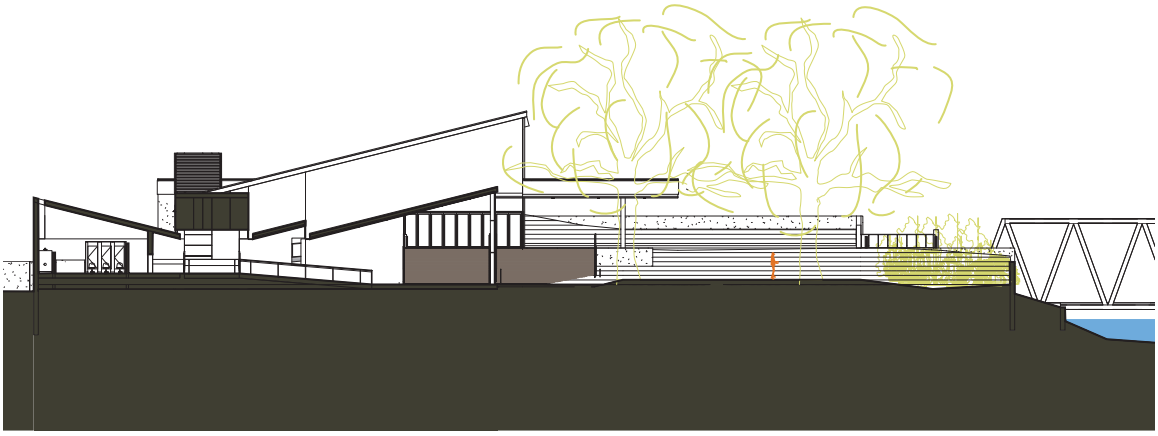


Figure 11.3: Lateral Section- Service, Lobby, Alleé

While the Wall provides a strong built edge, the threshold between inside and out is blurred by staggering doors and the ceiling edge. The floor surface transitions from a sprung wooden floor with radiant heating ideal for barefoot dancing to durable stone pavers suitable for large events to groomed lawn designed for walking slowly to a dense wetland planting.

Figure 11.4: Physical Model

With the doors open, an evening dance spills easily from studio to patio. Musicians that occupy the porch have prospect and refuge simultaneously (Figure 11.5).

FIGURE 11.5: Dance on the Patio

The transition from inside to outside is multi layered and includes a curtain wall (Figure 11.6), sun shading devices (Figure 11.7) and hardscape/softscape distinctions (Figure 11.8).

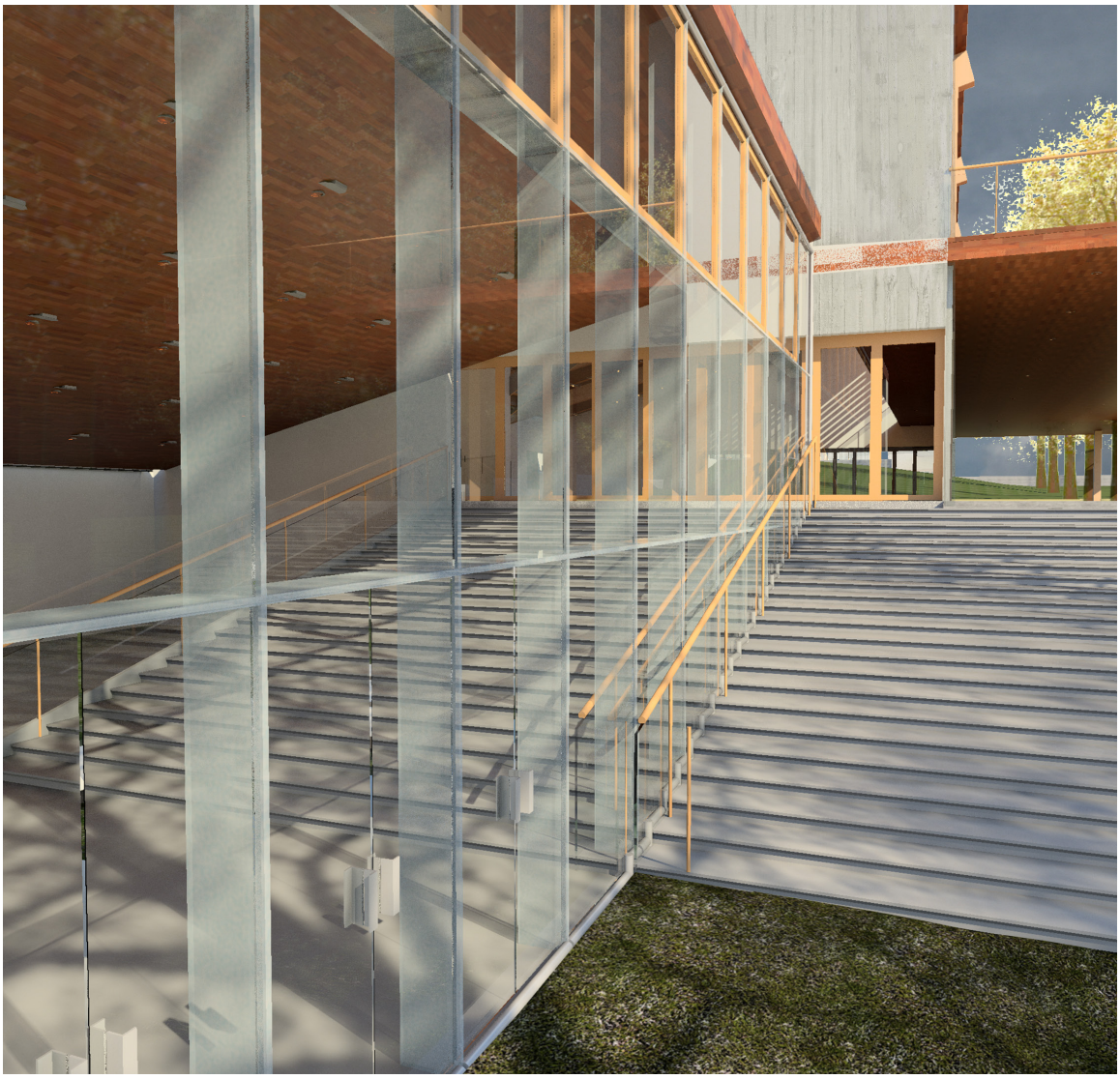


Figure 11.6: Curtain Wall Links Lobby to Alleé

Figure 11.7: The Porch Overlooks Studio and Alleé

Figure 11.8: The Entrance in an Eroded Wall

The alleé begins at the railroad tracks and rises towards the river (Figure 11.9). It ends at the floodwall looking over top of another railroad spur (Figure 11.10).

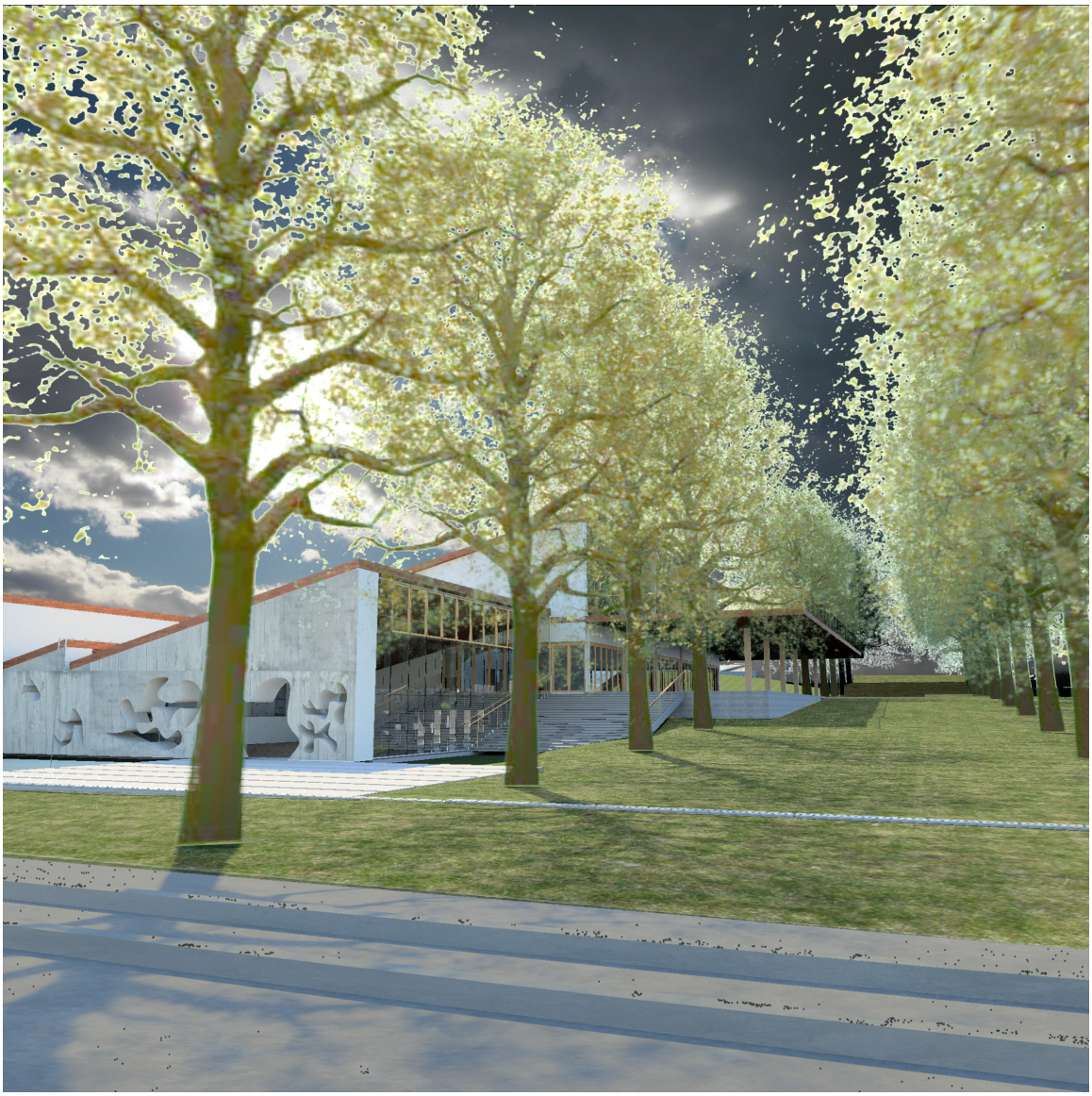


FIGURE 11.9: The Alleé Rises Toward the River

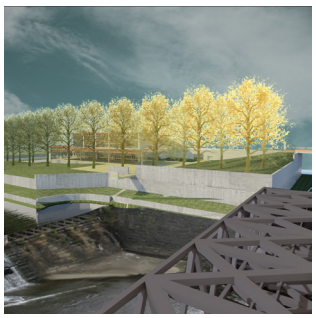


FIGURE 11.10: The Alleé Ends at the Floodwall

The deck provides a gathering place for communal experience of the sunset (Figure 11.11).

The overlook is narrow to limit the quantity of visitors and promote intimacy (Figure 11.12).

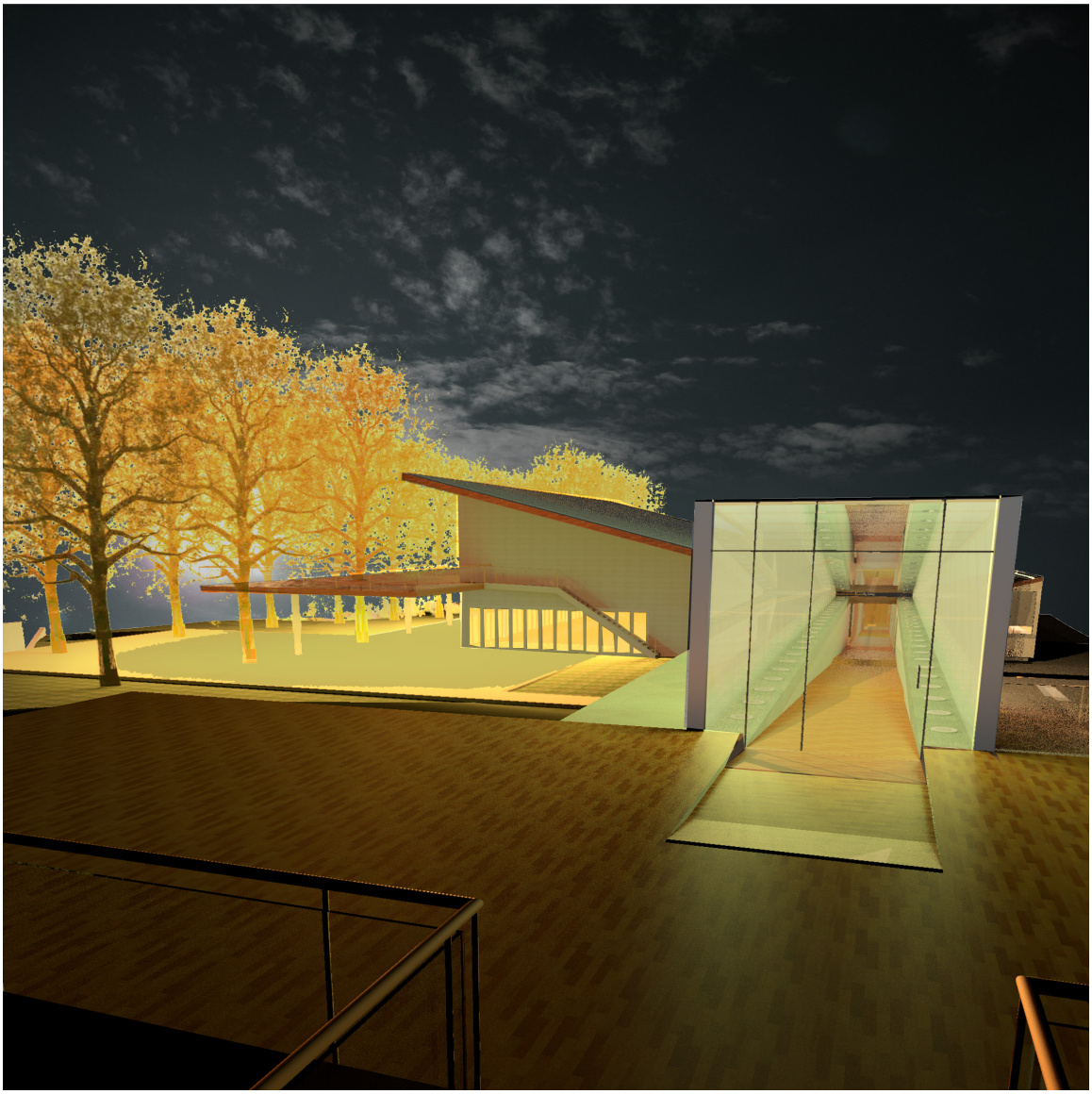


Figure 11.11: The Studio and Ramp Glow at Night

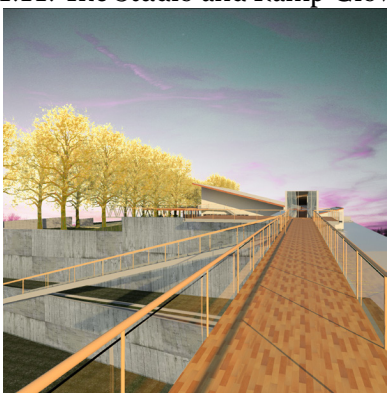


Figure 11.12: The Sun Sets Over the Alleé

The primary interior axis is a long ramp (Figure 11.13) that ascends from the street to the deck and beyond to the overlook. The glazed rain gutter allows sun to define the experience through the ramp (Figure 11.14). But on a rainy day, it is the sound and texture of running water that transforms the journey.

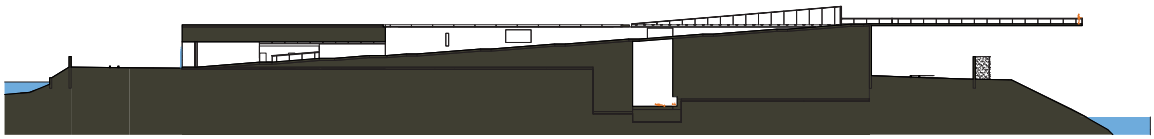


FIGURE 11.13: Longitudinal Sections - Section 1

FIGURE 11.14: The Ramp Pulls Visitors Toward the Light

Carefully-placed apertures provide views into the Studio (Figure 11.15), Lobby (Figure 11.16), and out towards the rising sun.

Figure 11.15: View of Studio from Ramp

Figure 11.16: The Lobby Connects Studio, Ramp, Alleé, and Entrance

Most of 160 Middle Water is designed to be experienced over and over again because repeated experiences underscore the duality of permanence and temporality. But much the way Juan might spend most of his childhood in the lowlands of South Holyoke and one day decide to ascend to the top of Mt. Tom for a profoundly transforming experience, so too might he decide to descend through a path (Figure 11.17) adjacent to the ramp into the depths of the earth.

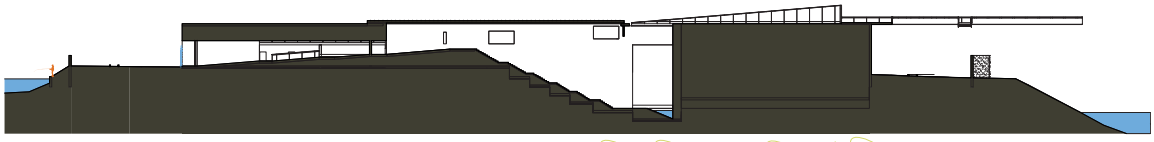


FIGURE 11.17: Longitudinal Sections - Section 2

The Meditation Chamber (Figure 11.18) is for solitary experience of the sun, fire, and water in their purest forms. As Earth spins, sunlight traces across the concrete walls. As the river level rises, so too does the surface of the aquifer-fed meditation pool.

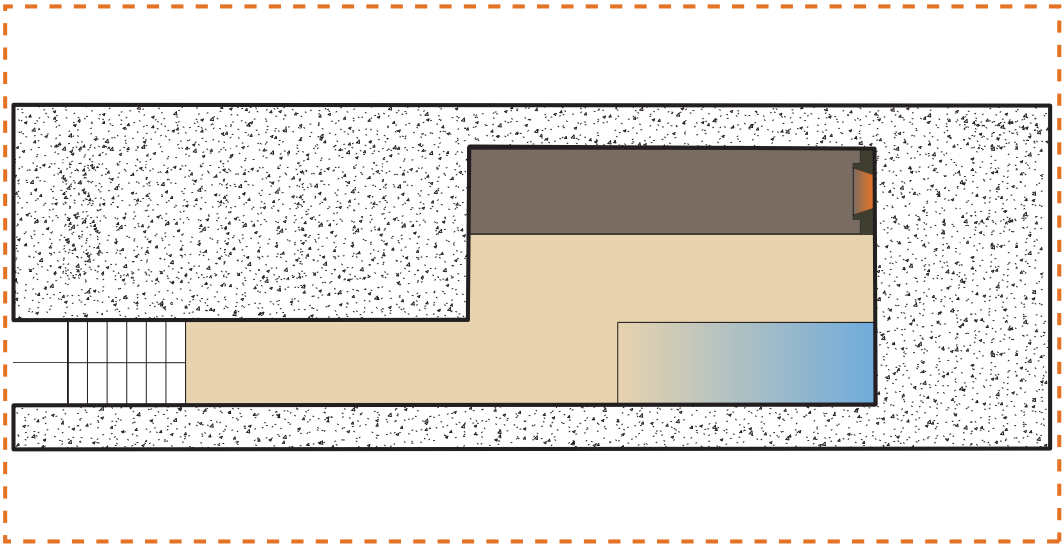


FIGURE 11.18: Plan of Meditation Chamber

In this space, most of the experience of the environment is beyond control – open to the sky (Figure 11.19), rain and snow penetrate. During a major flood event, the entire chamber is filled with water. On any day of the year, the ambient temperature is around 55 degrees.

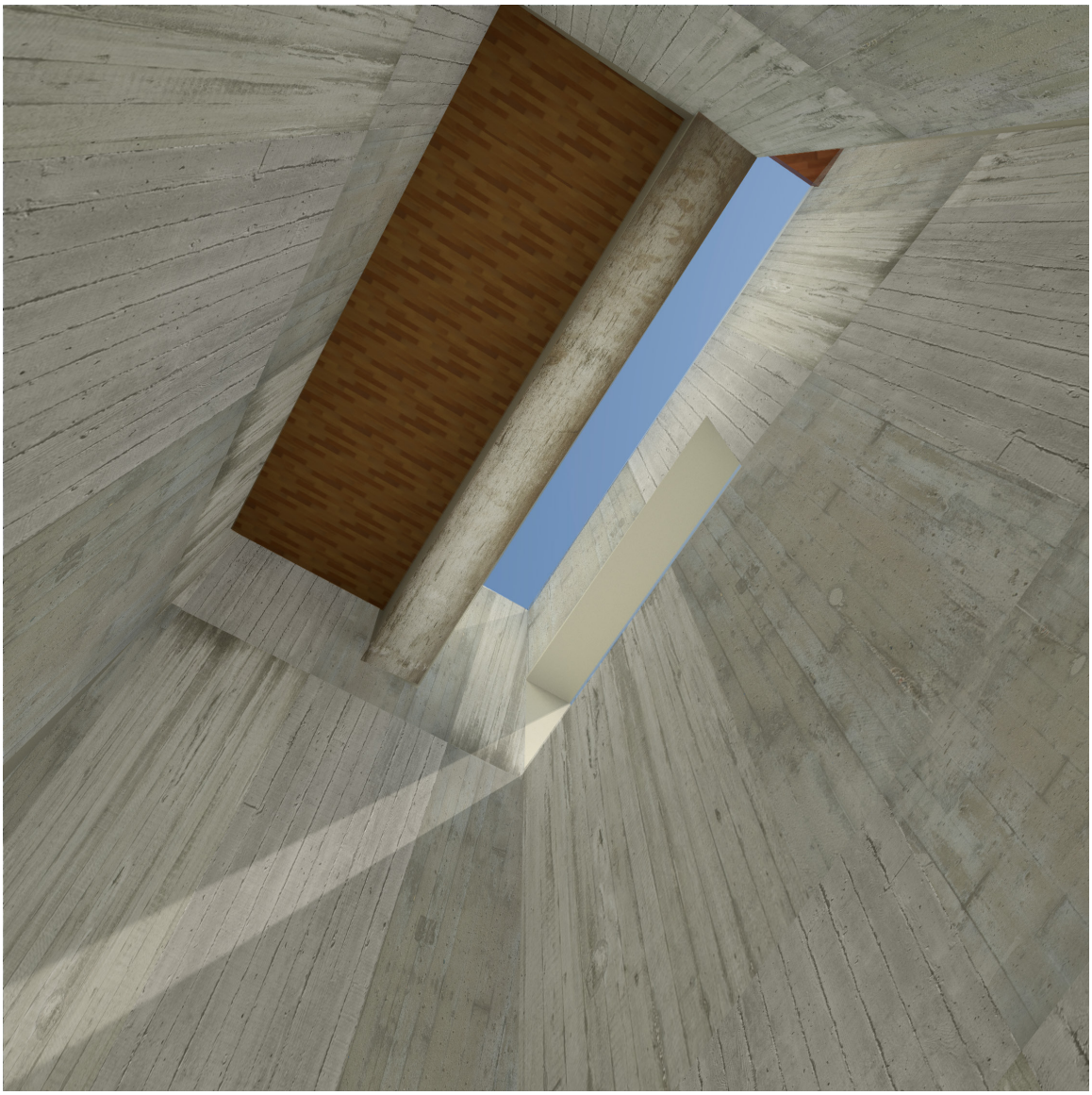


FIGURE 11.19: Daylight Penetrates

And yet, we have power and agency in the larger interconnected web of existence and so too do we have power and agency in the Chamber. The hearth extends to create a meditation bench so that the process of tending a fire for a long time produces comforting warmth. The slowness of experience allows the subtle changes in light and water to transform and reveal the profound.

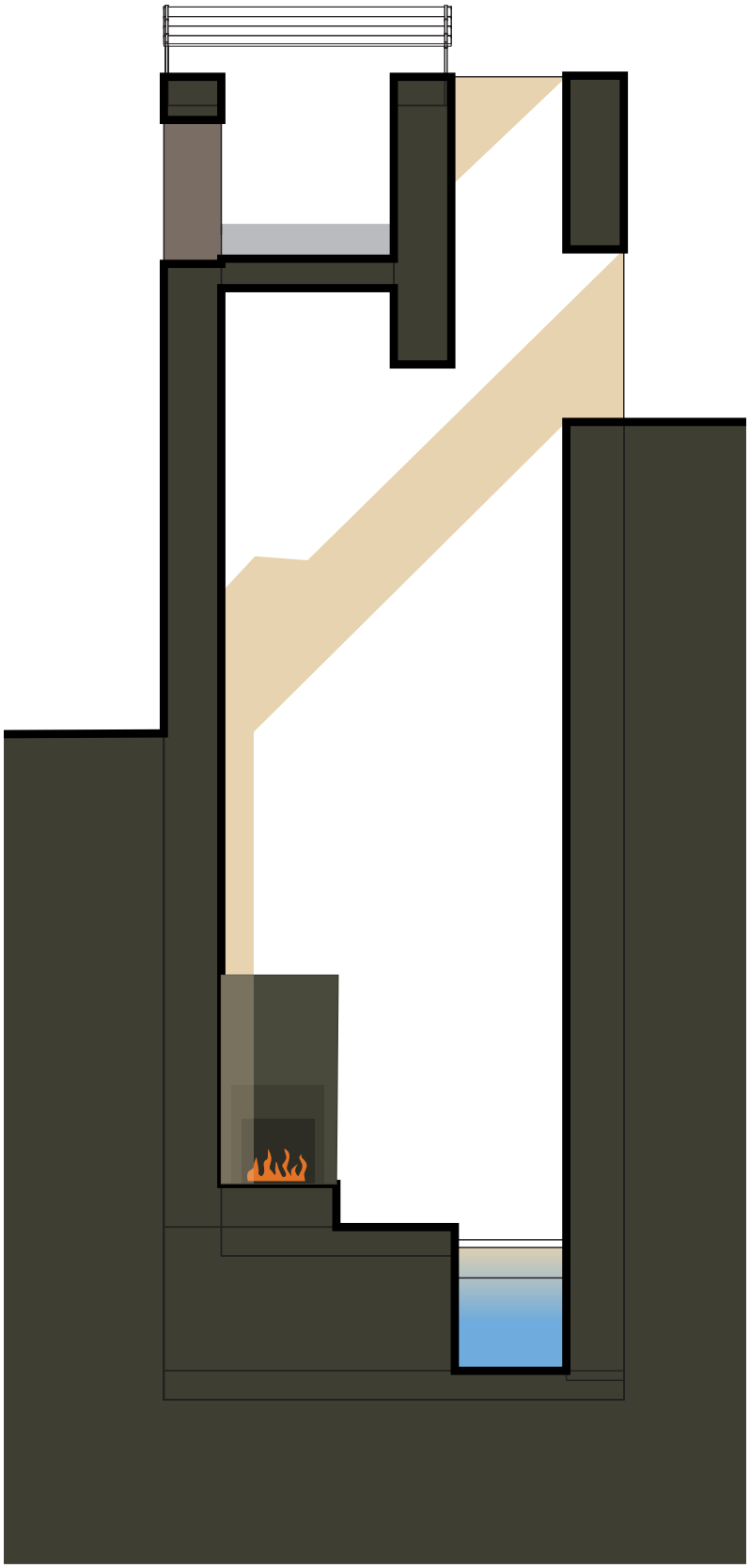


FIGURE 11.20: Section Through Meditation Chamber

FIGURE 11.21: Fire and Water in the Meditation Chamber

CONCLUSION

"In our apparent mastery of urban nature we are seemingly protected from all nature's dangers but chance losing any sense of wonder and awe for the nonhuman world."[1]

-Jennifer Wolch

Given humankind's ability to dramatically affect the natural systems on our planet, designers are responsible for shaping human consciousness by re-integrating daily routine with the short and long-term effects of our actions.

Rifkin believes that consciousness is the product of communications technologies and energy regimes. In Chapter 9: Program, I refined this definition by specifying that consciousness is shaped by communal gatherings of various sizes; embodied awareness of the individual self; earthly connection to the elements; ritual and tradition; phenomenological majesty that defies explanation; temporal significance; solitary meditation; information dissemination; and creative expression.

As illustrated in SECTION IV: DESIGN PROPOSAL, 160 Middle Water Street builds empathic consciousness through a community gathering space designed for full-bodied dancing. The earth, river, and sky shape experience not only through phenomenological majesty, but also through visceral and tactile interaction between dancers and the elements. Specific moments throughout the year are marked as the space itself serves as a sun clock, tracking the spinning earth on its journey around the sun. Sacred rituals and cultural traditions are welcomed at the river's edge, patio, studio, lobby, alleé, and even the meditation chamber - though the meditation's chamber's primary purpose is for solitary experience of natural elements in their purest form. Information about the hydrology of the canals, the ecology of wetland plants, and celestial patterns are disseminated not through linear strategies, but though experiential discourse. All of 160 Middle Water Street is intended for creative expression as we gather to share our new consciousness.

1 Wolch, 1998.

BIBLIOGRAPHY

Aeschbacher, Peter. Democracy and the Necessity for Spaces of Last Resort. Pennsylvania State University. 2008.

Baker, David. "Pent-up (Affordable) Housing Demand." The Registry (May 2011): 17.

Barnes, Allison and Paul Thagard. "Empathy and Analogy". University of Waterloo, 1997.

Balmori, Diana, and Joel Sanders. Groundwork: Between Landscape and Architecture. New York: Monacelli Press, 2011.

Cecil Group. South Holyoke Revitalization Strategy. 2008.

Crowe, Norman. Nature and the Idea of a Man-Made World: An Investigation into the Evolutionary Roots of Form and Order in the Built Environment. Cambridge, Massachusetts: The MIT Press, 1995.

Cruz, Teddy. Casa Familiar: Living Rooms at the Border and Senior Housing with Childcare. Small Scale Big Change, MOMA. 2010.

Gore, Al. An Inconvenient Truth: The Planetary Emergency of Global Warming and What We Can Do About It. Emmaus, Pennsylvania: Rodale, 2006.

Hawken, Paul. The Ecology of Commerce: A Declaration of Sustainability. New York: Harper Business, 2010.

Higgs, Eric. Nature by Design: People Natural Process, and Ecological Restoration. Boston: Massachusetts Institute of Technology, 2003.

Kellert, Stephen R., Judith Heerwagen, and Martin Mador. Biophilic Design: The Theory, Science, and Practice of Bringing Buildings to Life. Hoboken, New Jersey: Wiley, 2008.

Kunstler, James Howard. The Long Emergency: Surviving the End of Oil, Climate Change, and other Converging Catastrophes of the Twenty-First Century. New York: Grove Press, 2005.

Lao-Montes, Agustin. "Bridging Divides, Building Futures: A Puerto Rican Perspective." Planners Network National Conference, Holyoke Massachusetts: June 15, 2002.

Lyle, John Tillman. Regenerative Design for Sustainable Development. New York: John Wiley & Sons, Inc., 1994.

Manfredi, Michael A. and Marion Weiss. Weiss/Manfredi: Surface/subsurface. New York: Princeton Architectural Press, 2007.

Mann, Charles. 1491: New Revelations of the Americas Before Columbus. New York: Knopf, 2005.

Mann, Charles. 1492: Uncovering the New World Columbus Created. New York: Knopf, 2011.

Marris, Emma. Rambunctious Garden: Saving Nature in a Post-Wild World. New York: Bloomsbury, 2011.

McDonough, William. "Design, Ecology, Ethics and The Making of Things." The Cathedral of St. John the Divine, February 7 1993. William McDonough Architects: 1993.

McDonough, William and Michael Braungart. Cradle to Cradle: Remaking the Way We Make Things. New York: North Point Press, 2000.

Montgomery, David R. Dirt: The Erosion of Civilizations. Berkely: University of California Press, 2007.

Nassauer, J.I. Placing Nature: Culture and Landscape Ecology. Island Press, Washington, D.C.: 1997.

Nassauer, J.I. “Culture and Changing Landscape Structure.” Landscape Ecology. 10:4, 1995. pp. 229-237.

Ouroussoff, Nicolai. “Learning From Tijuana: Hudson, N.Y., Considers Different Housing Model.” The New York Times, February 19, 2008, sec. Arts / Art & Design.

Plaisance, Mike. “Holyoke Raid Bashes Haven of La Familia Street Gang in Multiagency Pounce That Nets 11 Arrests, Guns, Drugs, $38,000 Cash.” The Republican, March 9, 2013.

Poole, A. F., J. J. Stoner, and Beck & Pauli. “Bird’s Eye View of the 1881 City of Holyoke, and Village of South Hadley Falls, Mass.” Madison, Wis: J. J. Stoner, 1881. Library of Congress Geography and Map Division Washington, D.C.

Pollan, Michael. A Place of My Own: The Education of an Amateur Builder. New York: Random House, 1997.

Portoghesi, Paolo. Nature and Architecture [Natura e architettura]. trans. Erika G. Young 1st ed. Milan; New York: Skira Editore; Abbeville Pub. Group, 2000.

Rifkin, Jeremy. Biosphere Politics: A New Consciousness for a New Century. New York: Crown Publishers, 1991.

Rifkin, Jeremy. The Empathic Civilization: The Race to Global Consciousness in a World Crisis. New York: Jeremy P. Tarcher/Penguin, 2009.

Rifkin, Jeremy. The Third Industrial Revolution: How Lateral Power is Transforming Energy, The Economy, and the World. New York: Palgrave Macmillan, 2011.

Pontynen, Arthur. For the Love of Beauty: Art, History, and the Moral Foundations of Aesthetic Judgment. New Brunswick, New Jersey: Transaction Publishers, 2006.

Sagan, Carl. Pale Blue Dot: A Vision of the Human Future in Space.. Ballantine Books, 1997.

Thoreau, Henry David. Walden : An Annotated Edition. Edited by Walter Harding. Houghton Mifflin Harcourt, 1995.

Till, Jeremy. "Architecture of the Impure Community." Occupations of Architecture, Jonathan Hill ed. Routledge, London 1998. p61-75.

Trefil, James. Human Nature: A Blueprint for Managing the Earth - by People, for People. New York: Times Books, 2004.

Wolch, Jennifer R., and Jody Emel. Animal Geographies: Place, Politics, and Identity in the Nature-Culture Borderlands. Verso, 1998.

Woodbridge Neighborhood Development Corporation with Detroit Collaborative Design Center. Woodbridge Neighborhood Development Strategy. University of Detroit Mercy School of Architecture, 2008.